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APPENDICES

Appendix A Temperature Profiles

Table A1 Pyrolysis conditions: Non-catalytic Pyrolysis

Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	27.7	27.3	32	362.8	505.6	62	372.6	501.1	92	351.0	500.0
4	39.5	44.3	34	383.6	500.8	64	362.2	499	94	349.1	499.4
6	48.3	58.7	36	395.0	505.4	66	362.1	501.4	96	349.1	500.0
8	66.0	86.2	38	400.5	501.4	68	357.0	500.0	98	348.0	500.0
10	94.3	129.7	40	401.5	492.5	70	353.2	502.1	100	347.1	501.3
12	116.9	160.0	42	403.6	501.9	72	349.5	496.4	102	347.7	499.0
14	159.9	217.2	44	403.4	506.3	74	345.7	500.1	104	348.7	500.4
16	195.3	265.4	46	402.9	501.9	76	340.7	498.5	106	348.9	500.9
18	211.7	287.7	48	401.2	495.5	78	357.7	500.1	108	351.7	501.2
20	254.3	365.7	50	401.2	492.5	80	336.6	499.4	110	352.7	500.8
22	321.7	436.6	52	395.1	496.3	82	335.5	499.8	112	350.2	500.0
24	279.9	463.5	54	390.8	499.7	84	331.1	498.6	114	349.1	500.0
26	321.3	390.7	56	386.5	500.6	86	350.6	502.1	116	350.8	500.7
28	323.7	415.4	58	383.6	500.1	88	350.3	499.4	118	350.7	500.6
30	330.8	550.2	60	377.4	500.2	90	350.4	500.2	120	350.8	500.0

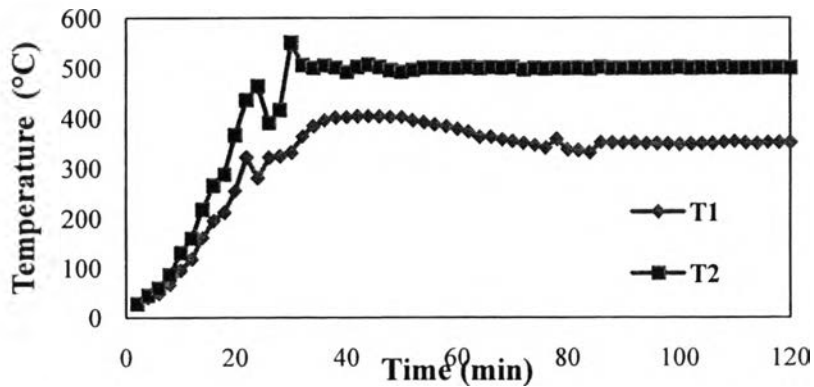


Figure A1 Temperature profiles of non-catalytic pyrolysis.

Table A2 Pyrolysis conditions: SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	30.2	31.5	32	361.0	500.0	62	378.5	494.0	92	362.2	500.9
4	60.5	62.4	34	359.6	500.4	64	371.1	495.9	94	360.7	499.7
6	68.7	85.2	36	360.8	499.7	66	351.1	499.8	96	375.8	499.8
8	71.5	102.8	38	368.2	496.8	68	349.7	500.5	98	356.5	500.8
10	81.2	131.5	40	371.9	500.8	70	348.9	499.9	100	359.2	500.2
12	119.9	178.5	42	381.1	501.2	72	347.0	500.6	102	360.2	499.7
14	150.2	228.9	44	379.8	496.5	74	346.8	499.7	104	359.9	499.8
16	170.1	300.2	46	383.0	497.5	76	342.8	500.0	106	351.7	500.1
18	190.4	320.4	48	382.1	500.5	78	341.1	499.0	108	351.2	498.3
20	131.1	391.5	50	379.8	501.1	80	342.8	500.2	110	349.3	500.8
22	292.6	438.6	52	380.1	500.3	82	341.1	500.7	112	350.0	500.6
24	327.1	478.8	54	379.5	505.0	84	364.1	500.5	114	351.1	499.1
26	334.6	500.3	56	378.5	502.4	86	365.5	501.0	116	348.9	499.6
28	343.6	489.8	58	371.8	502.0	88	363.7	502.5	118	347.1	499.7
30	350.5	500.2	60	373.3	499.5	90	362.2	499.0	120	346.9	500.1

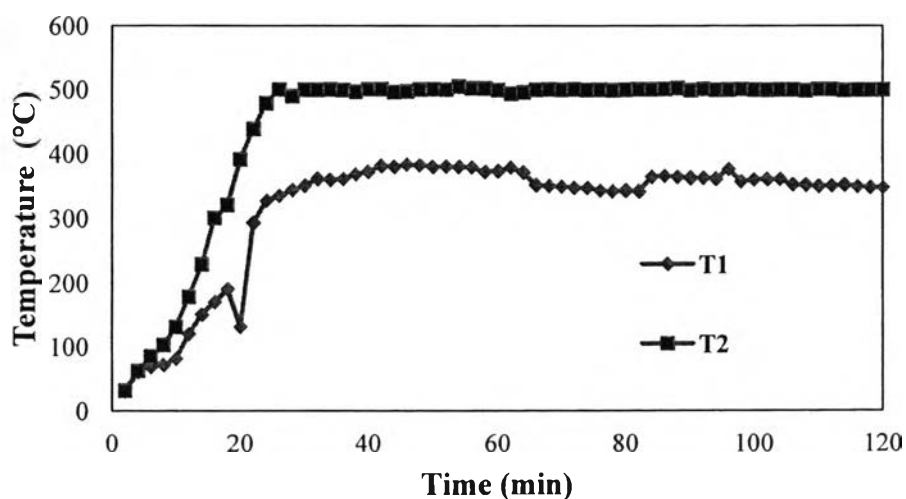
**Figure A2** Temperature profiles of SAPO-34.

Table A3 Pyrolysis conditions: 5 %Co/SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	25.0	25.1	32	337.9	492.9	62	368	501.7	92	360.4	500.0
4	30.7	35.6	34	349.5	495.2	64	369.3	499.5	94	360.2	501.1
6	40.7	53.7	36	359.8	489.2	66	367	500.1	96	360.6	500.6
8	55.4	78.2	38	366.7	482.9	68	368.3	499.9	98	356.8	500.1
10	76.2	109.3	40	371.9	476.0	70	366.4	500.4	100	351.8	499.1
12	105.3	150.6	42	375.2	463.9	72	365.4	500.4	102	351.1	501.6
14	137.5	193.6	44	372.9	488.7	74	363.4	501.1	104	350.0	500.3
16	174.9	241.2	46	374.2	455.9	76	361.9	500.0	106	349.8	499.8
18	213.7	295.7	48	371.7	476.8	78	361.1	500.0	108	350.0	500.0
20	250.6	349.1	50	370.0	501.5	80	360.4	500.3	110	350.3	499.9
22	303.2	412.5	52	369.5	505.7	82	360.0	500.0	112	351.2	499.8
24	321.2	445.0	54	366.1	499.7	84	360.2	499.3	114	350.2	499.4
26	320.9	480.4	56	366.8	500.8	86	359.7	498.2	116	351.1	500.4
28	309.1	498.4	58	367.8	500.1	88	357.8	500.0	118	350.4	500.0
30	327.2	492.5	60	366.7	500.0	90	367.7	500.1	120	350.8	500.4

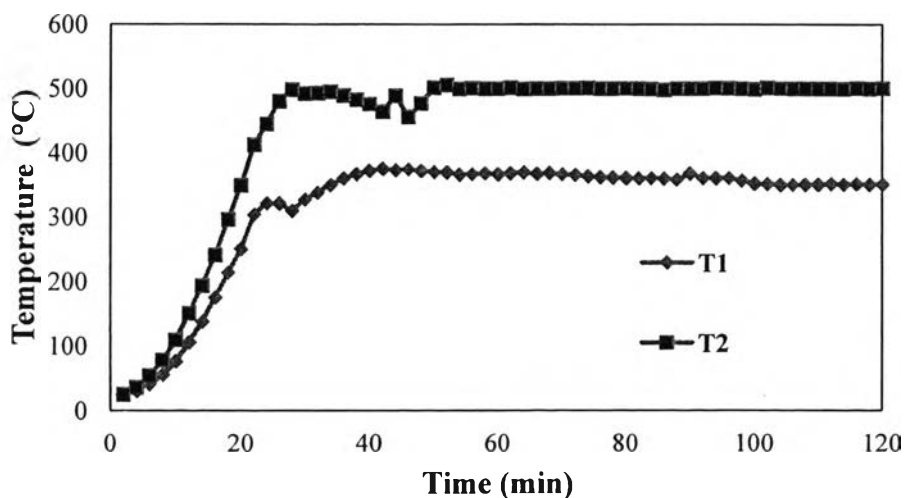
**Figure A3** Temperature profiles of 5 %Co/SAPO-34.

Table A4 Pyrolysis conditions: 5 %Co/HYTire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.6	27.4	32	324.4	501.7	62	352.1	500.2	92	348.9	498.9
4	33.7	40.2	34	340.6	498.5	64	352.0	499.6	94	349.8	500.8
6	45.7	39.8	36	343.7	506.1	66	353.2	500.1	96	350.2	500.6
8	61.9	83.5	38	358.8	499.2	68	355.0	499.9	98	362.6	500.1
10	84.9	118.5	40	363.6	494.7	70	359.9	500.4	100	358.3	500.0
12	117.7	165.4	42	367.0	495.7	72	359.8	500.4	102	356.8	501.6
14	145.0	207.6	44	369.4	499.9	74	350.0	501.1	104	355.1	500.0
16	180.0	254.8	46	369.0	500.0	76	350.0	501.2	106	353.2	499.8
18	219.3	306.4	48	367.9	500.0	78	351.2	500.2	108	352.1	500.0
20	260.3	424.5	50	368.3	500.9	80	347.8	500.3	110	352.6	499.0
22	305.2	307.2	52	370.1	500.8	82	351.1	499.0	112	349.9	500.4
24	306.7	424.5	54	368.5	498.8	84	352.1	500.1	114	350.0	500.3
26	282.7	453.4	56	350.0	499.3	86	359.5	498.2	116	350.1	502.7
28	288.4	492.6	58	351.8	500.2	88	358.7	500.0	118	350.1	500.0
30	309.7	511.8	60	389.1	500.0	90	352.1	499.9	120	351.4	500.1

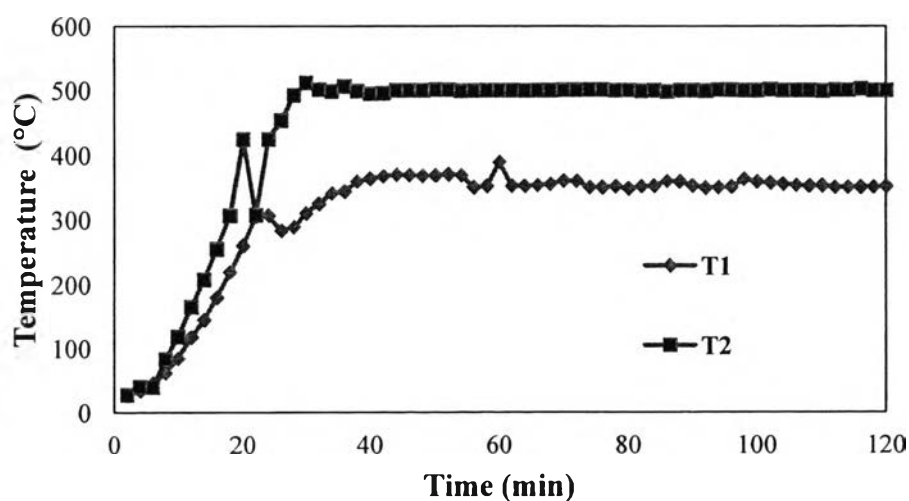
**Figure A4** Temperature profiles of 5 %Co/HY.

Table A5 Pyrolysis conditions: HBETATire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	23.1	23.6	32	350.4	509.8	62	395.5	500.0	92	351.5	499.7
4	31.2	39.8	34	371.2	510.2	64	395.0	499.9	94	350.0	502.4
6	43.4	49.8	36	387.4	511.3	66	354.2	500.4	96	349.3	500.6
8	56.3	78.4	38	390.2	506.4	68	345.9	500.4	98	349.0	500.3
10	75.3	126.7	40	391.1	503.2	70	350.4	501.1	100	351.1	500.4
12	99.1	169.7	42	387.4	500.2	72	349.5	500.2	102	350.1	500.1
14	127.3	221.1	44	386.3	498.4	74	349.0	502.1	104	349.0	499.8
16	165.2	282.1	46	384.2	502.2	76	348.7	498.7	106	349.0	499.8
18	207.1	340.2	48	381.0	495.3	78	350.6	499.9	108	349.0	500.2
20	237.8	401.8	50	387.2	499.8	80	351.4	500.2	110	346.8	501.1
22	298.7	487.9	52	386.4	501.4	82	351.7	499.9	112	349.3	500.0
24	320.8	499.8	54	381.1	500.1	84	348.9	498.7	114	347.8	499.9
26	341.2	500.6	56	375.3	500.4	86	348.9	499.9	116	349.0	498.2
28	356.7	509.8	58	369.1	499.6	88	349.0	499.5	118	350.2	500.2
30	358.6	510.0	60	361.7	498.9	90	348.0	499.2	120	349.0	501.2

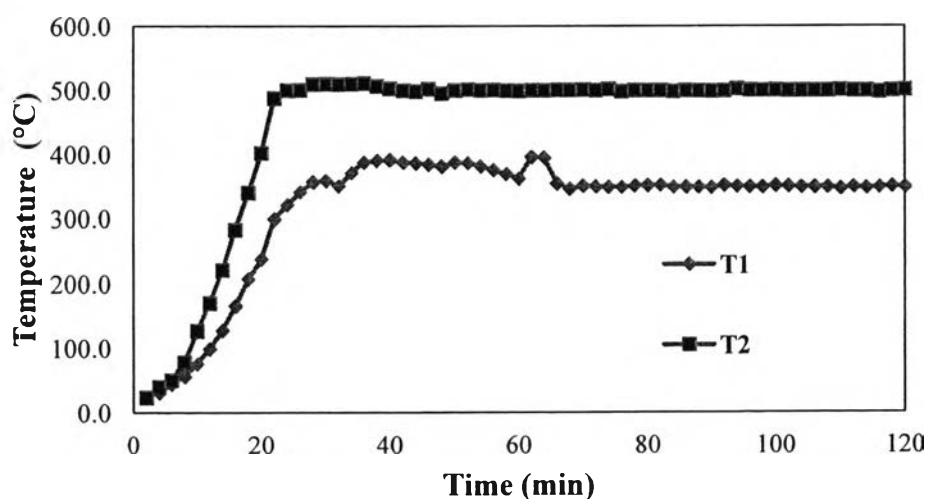
**Figure A5** Temperature profiles of HBETA.

Table A6 Pyrolysis conditions: 5 %Co/HBETATire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	28.0	27.4	32	364.4	509.6	62	354.4	498.6	92	363.2	500.3
4	33.7	39.9	34	381.3	510.2	64	355.9	500.9	94	361.2	500.0
6	44.2	59.8	36	382.3	503.3	66	355.5	498.8	96	359.6	499.8
8	62.8	91.8	38	358.6	498.6	68	361.1	500.4	98	355.9	501.5
10	94.1	135.2	40	356.7	499.8	70	362.2	499.8	100	358.2	500.4
12	122.2	170.8	42	366.7	501.2	72	350.5	499.8	102	363.2	500.9
14	163.6	238.7	44	376.7	498.5	74	365.3	500.8	104	357.5	500.0
16	188.4	273.8	46	362.2	494.6	76	366.0	499.4	106	357.6	499.8
18	227.3	329.6	48	356.3	500.5	78	365.4	500.1	108	354.2	499.8
20	265.7	374.0	50	345.5	501.2	80	365.2	500.0	110	363.2	500.6
22	286.7	398.8	52	347.4	500.1	82	366.3	499.8	112	355.8	500.0
24	297.6	460.4	54	350.0	500.0	84	365.4	500.3	114	354.2	501.2
26	301.4	456.9	56	342.9	501.1	86	364.2	498.7	116	352.1	499.8
28	307.2	499.8	58	345.1	505.7	88	363.4	501.2	118	350.9	500.2
30	328.8	513.6	60	348.7	501.9	90	362.7	500.1	120	351.2	499.9

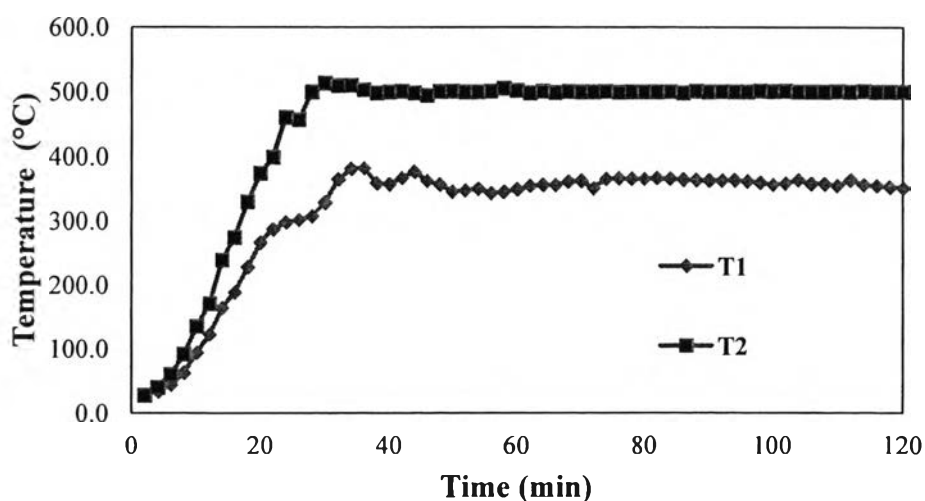
**Figure A6** Temperature profiles of 5 %Co/HBETA.

Table A7 Pyrolysis conditions: 5 %Co/HMORTire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	24.7	25.6	32	351.2	504.5	62	349.7	502.4	92	350.0	500.1
4	29.6	37.6	34	365.4	502.1	64	339.6	501.2	94	351.2	498.4
6	40.0	58.3	36	370.1	498.6	66	347.2	504.5	96	349.7	499.3
8	55.9	84.8	38	378.7	486.7	68	355.4	500.9	98	346.7	498.7
10	83.8	125.2	40	371.2	498.8	70	355.2	500.0	100	348.1	499.3
12	113.4	165.7	42	359.8	499.5	72	351.1	499.8	102	350.1	501.5
14	154.2	222.7	44	346.4	500.0	74	342.5	503.8	104	348.7	498.7
16	186.1	267.5	46	346.3	505.7	76	348.1	500.6	106	346.8	500.3
18	229.8	323.5	48	355.7	497.6	78	350.7	500.1	108	350.5	502.9
20	270.0	372.1	50	351.7	494.7	80	350.4	500.0	110	351.2	500.1
22	306.5	436.2	52	342.3	507.5	82	346.7	501.2	112	351.4	501.1
24	327.3	457.5	54	348.1	503.7	84	351.3	500.0	114	349.8	499.8
26	302.3	512.4	56	357.5	501.1	86	346.8	500.8	116	348.6	502.3
28	319.3	510.1	58	357.1	499.4	88	344.3	498.7	118	347.5	499.4
30	321.1	508.5	60	352.4	500.0	90	344.7	501.4	120	351.2	500.2

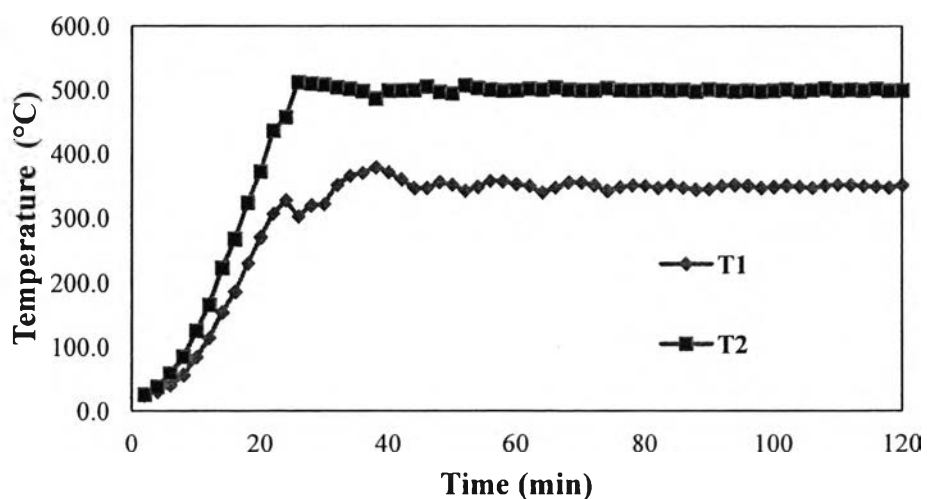
**Figure A7** Temperature profiles of 5 %Co/HMOR.

Table A8 Pyrolysis conditions: HZSM-5Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	22.7	24.1	32	374.1	507.5	62	359.8	500.9	92	339.7	500.5
4	26.1	34.1	34	371.1	500.2	64	361.9	501.4	94	340.2	499.3
6	37.1	58.5	36	373.4	500.4	66	359.6	498.8	96	342.1	501.2
8	48.5	80.3	38	373.0	498.0	68	353.8	500.5	98	342.4	500.3
10	64.5	112.6	40	375.0	505.3	70	348.0	498.2	100	343.6	500.5
12	86.6	151.3	42	375.0	497.5	72	346.9	502.7	102	343.7	500.1
14	114.0	194.3	44	371.7	494.8	74	353.0	501.1	104	343.9	499.8
16	147.0	245.0	46	366.2	498.5	76	358.6	499.3	106	342.7	499.5
18	167.9	305.5	48	361.1	502.7	78	360.0	496.6	108	345.7	499.7
20	211.5	354.8	50	357.0	500.7	80	358.6	497.8	110	346.2	501.2
22	272.3	422.9	52	361.0	501.7	82	349.8	500.9	112	347.8	502.3
24	324.7	494.3	54	363.8	499.1	84	345.5	499.8	114	350.2	500.4
26	318.8	520.2	56	363.4	500.4	86	341.7	499.8	116	349.4	499.4
28	308.3	520.2	58	357.0	500.1	88	340.4	500.4	118	349.8	498.2
30	343.4	521.4	60	355.0	500.2	90	349.7	502.2	120	351.2	500.7

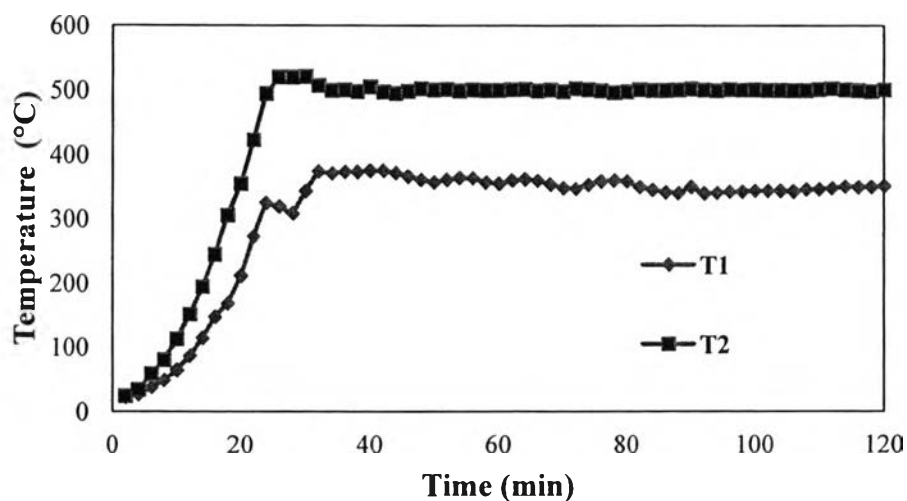
**Figure A8** Temperature profiles of HZSM-5.

Table A9 Pyrolysis conditions: 5 %Co/HZSM-5Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	31.2	34.9	32	345.8	517.0	62	359.5	500.3	92	358.0	500.7
4	37.0	47.9	34	351.3	510.6	64	355.1	499.4	94	357.6	499.8
6	53.4	67.9	36	368.1	499.6	66	358.7	499.7	96	358.6	499.9
8	78.2	110.9	38	378.2	491.0	68	357.7	501.1	98	355.3	500.3
10	93.5	139.8	40	384.5	506.7	70	357.2	500.0	100	355.4	501.6
12	135.1	199.8	42	390.1	503.6	72	356.2	500.2	102	356.2	500.7
14	158.2	233.7	44	391.1	500.0	74	356.9	500.1	104	356.6	499.8
16	195.7	289.3	46	388.3	501.4	76	357.7	501.2	106	355.3	498.9
18	236.8	343.6	48	382.1	495.3	78	358.2	500.3	108	354.3	500.2
20	248.7	402.4	50	381.1	499.2	80	356.8	499.4	110	352.1	500.6
22	321.2	444.1	52	375.1	500.0	82	359.2	500.1	112	350.2	499.8
24	326.1	497.6	54	374.2	499.5	84	358.7	499.9	114	350.4	500.8
26	349.8	501.3	56	371.7	500.7	86	357.8	501.5	116	352.3	498.2
28	356.7	505.2	58	365.5	499.6	88	358.7	502.1	118	353.4	500.2
30	331.9	524.1	60	361.1	501.0	90	359.3	500.4	120	354.2	499.6

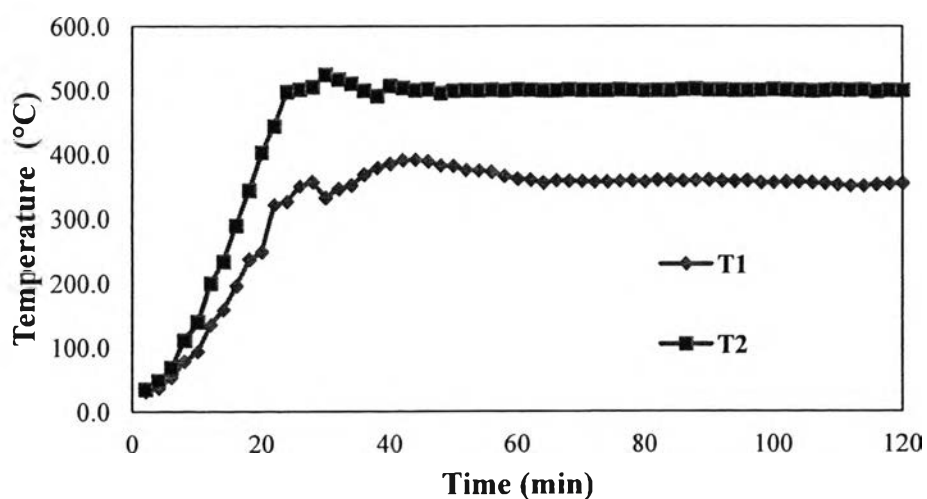
**Figure A9** Temperature profiles of 5 %Co/HZSM-5.

Table A10 Pyrolysis conditions: HY/SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	28.3	27.9	32	398.0	504.0	62	357.5	500.4	92	353.60	499.30
4	34.4	45.6	34	385.7	498.8	64	354.0	500.0	94	353.60	499.90
6	46.7	69.8	36	382.6	505.4	66	356.7	500.3	96	353.40	500.20
8	65.4	111.1	38	382.8	503.4	68	356.7	500.1	98	354.20	499.80
10	83.4	158.7	40	366.7	499.6	70	356.3	499.9	100	351.20	500.10
12	124.1	192.2	42	355.3	504.4	72	357.1	500.8	102	353.30	500.20
14	157.8	267.8	44	352.3	502.6	74	356.5	500.5	104	352.50	500.00
16	198.9	310.0	46	352.9	498.7	76	354.7	499.0	106	352.40	499.20
18	236.0	351.6	48	357.8	500.0	78	354.6	501.1	108	352.30	500.60
20	263.5	420.0	50	350.4	500.3	80	354.6	500.0	110	350.90	500.30
22	320.0	450.0	52	351.2	501.1	82	354.3	500.4	112	351.30	499.90
24	310.0	446.9	54	354.5	502.3	84	354.1	500.4	114	354.60	498.50
26	304.7	503.8	56	358.0	499.9	86	354.0	500.4	116	352.40	498.90
28	335.6	537.9	58	358.4	499.3	88	352.3	500.4	118	351.10	499.00
30	389.0	551.1	60	375.4	500.6	90	353.7	500.1	120	353.30	499.70

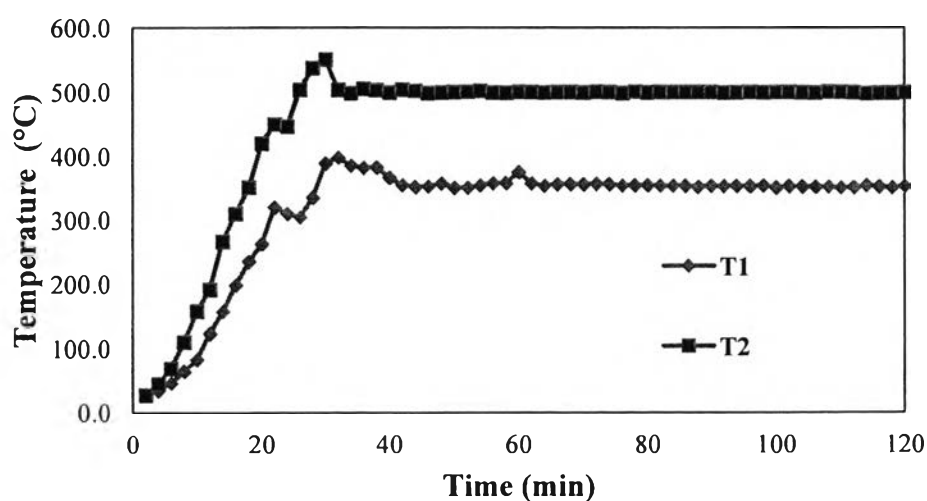
**Figure A10** Temperature profiles of HY/SAPO-34.

Table A11 Pyrolysis conditions: 5 %Co/HY/SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.1	27.8	32	378.9	500.2	62	367.2	500.8	92	350.1	499.8
4	31.6	37.9	34	372.8	479.1	64	367.8	499.8	94	351.0	501.2
6	49.5	71.2	36	357.9	479.0	66	364.3	499.5	96	354.2	502.3
8	62.9	104.1	38	325.7	482.2	68	364.1	500.2	98	351.3	501.3
10	97.2	151.5	40	320.0	495.0	70	357.7	500.3	100	349.7	499.8
12	126.0	192.5	42	338.5	501.7	72	354.4	500.5	102	350.1	500.0
14	167.7	250.4	44	345.6	502.6	74	354.5	498.7	104	349.9	501.2
16	207.8	303.4	46	351.0	497.8	76	344.7	499.0	106	351.0	499.8
18	232.0	350.8	48	367.0	500.6	78	350.8	500.0	108	351.3	503.2
20	227.0	416.7	50	371.5	497.0	80	349.1	500.2	110	353.2	503.2
22	320.3	477.0	52	361.0	495.8	82	350.0	500.1	112	358.7	499.8
24	324.0	494.2	54	345.8	499.4	84	349.9	502.3	114	354.3	501.5
26	325.0	503.3	56	350.0	501.2	86	352.3	500.8	116	359.8	500.1
28	351.1	527.0	58	359.8	500.9	88	352.5	503.2	118	355.4	500.3
30	367.8	515.9	60	358.1	499.8	90	353.1	500.1	120	354.1	499.7

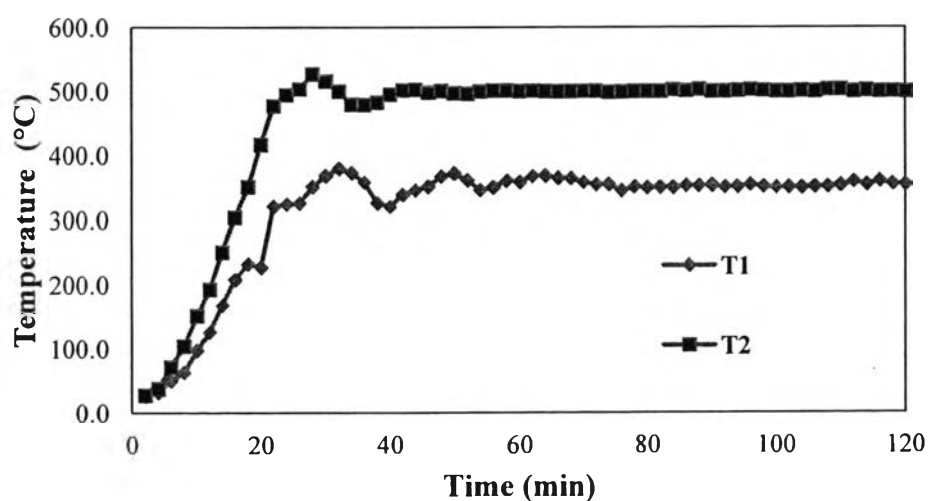
**Figure A11** Temperature profiles of 5 %Co/(HY+SAPO-34).

Table A12 Pyrolysis conditions: HMOR/SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.1	27.8	32	378.9	500.2	62	367.2	500.8	92	350.1	499.8
4	31.6	37.9	34	372.8	479.1	64	367.8	499.8	94	351.0	501.2
6	49.5	71.2	36	357.9	479.0	66	364.3	499.5	96	354.2	502.3
8	62.9	104.1	38	325.7	482.2	68	364.1	500.2	98	351.3	501.3
10	97.2	151.5	40	320.0	495.0	70	357.7	500.3	100	349.7	499.8
12	126.0	192.5	42	338.5	501.7	72	354.4	500.5	102	350.1	500.0
14	167.7	250.4	44	345.6	502.6	74	354.5	498.7	104	349.9	501.2
16	207.8	303.4	46	351.0	497.8	76	344.7	499.0	106	351.0	499.8
18	232.0	350.8	48	367.0	500.6	78	350.8	500.0	108	351.3	503.2
20	227.0	416.7	50	371.5	497.0	80	349.1	500.2	110	353.2	503.2
22	320.3	477.0	52	361.0	495.8	82	350.0	500.1	112	358.7	499.8
24	324.0	494.2	54	345.8	499.4	84	349.9	502.3	114	354.3	501.5
26	325.0	503.3	56	350.0	501.2	86	352.3	500.8	116	359.8	500.1
28	351.1	527.0	58	359.8	500.9	88	352.5	503.2	118	355.4	500.3
30	367.8	515.9	60	358.1	499.8	90	353.1	500.1	120	354.1	499.7

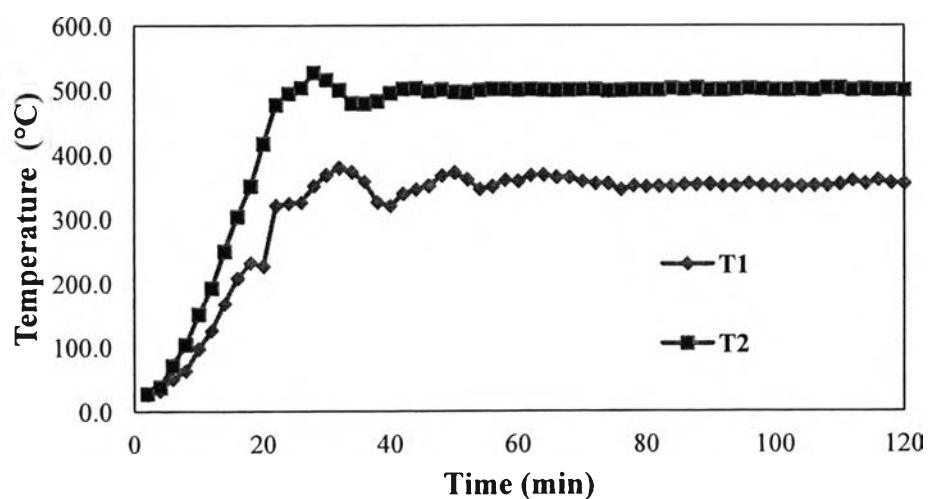
**Figure A12** Temperature profiles of HMOR/SAPO-34.

Table A13 Pyrolysis conditions: 5 %Co/(HMOR+SAPO-34)Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	28.3	27.9	32	398.0	504.0	62	357.5	500.4	92	353.60	499.30
4	34.4	45.6	34	385.7	498.8	64	354.0	500.0	94	353.60	499.90
6	46.7	69.8	36	382.6	505.4	66	356.7	500.3	96	353.40	500.20
8	65.4	111.1	38	382.8	503.4	68	356.7	500.1	98	354.20	499.80
10	83.4	158.7	40	366.7	499.6	70	356.3	499.9	100	351.20	500.10
12	124.1	192.2	42	355.3	504.4	72	357.1	500.8	102	353.30	500.20
14	157.8	267.8	44	352.3	502.6	74	356.5	500.5	104	352.50	500.00
16	198.9	310.0	46	352.9	498.7	76	354.7	499.0	106	352.40	499.20
18	236.0	351.6	48	357.8	500.0	78	354.6	501.1	108	352.30	500.60
20	263.5	420.0	50	350.4	500.3	80	354.6	500.0	110	350.90	500.30
22	320.0	450.0	52	351.2	501.1	82	354.3	500.4	112	351.30	499.90
24	310.0	446.9	54	354.5	502.3	84	354.1	500.4	114	354.60	498.50
26	304.7	503.8	56	358.0	499.9	86	354.0	500.4	116	352.40	498.90
28	335.6	537.9	58	358.4	499.3	88	352.3	500.4	118	351.10	499.00
30	389.0	551.1	60	375.4	500.6	90	353.7	500.1	120	353.30	499.70

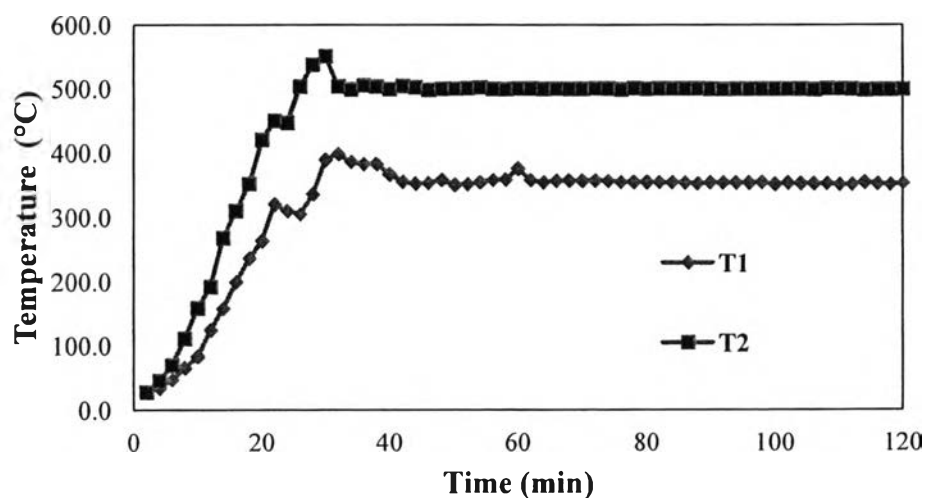
**Figure A13** Temperature profiles of 5 %Co/(HMOR+SAPO-34).

Table A14 Pyrolysis conditions: HBETA/SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.3	29.2	32	376.8	523.4	62	357.5	494.5	92	354.7	500.3
4	30.8	42.5	34	379	522.1	64	355.4	500.7	94	355.4	499.9
6	40.8	65.6	36	386.6	500.7	66	356.6	502.4	96	349.9	503.4
8	56.5	98.5	38	356.7	503.4	68	356.6	500	98	352.2	500.6
10	81.8	145.8	40	341.9	500.8	70	357.7	499.9	100	351.7	503.4
12	103.0	192.1	42	351.8	503.3	72	358.7	498.8	102	352.3	499.9
14	135.6	252.1	44	363.7	501.5	74	357.5	501.2	104	349.9	500.2
16	143.6	289.3	46	366.7	503.2	76	356.7	499.9	106	351.5	501.7
18	218.5	413.9	48	359.8	485.8	78	346.6	500.7	108	355.7	503.2
20	320.0	445.6	50	352.2	501.1	80	354.7	503.4	110	350.7	499.9
22	348.6	478.2	52	349.9	501.6	82	349.9	502.4	112	349.9	500.8
24	356.7	475.1	54	345.7	500.7	84	357.5	503.2	114	351.9	500.6
26	353.7	478.7	56	354.7	505.5	86	357.7	500.7	116	353.5	500.7
28	347.8	497.5	58	365.7	495.6	88	365.7	499.9	118	350.6	501.5
30	351.7	509.9	60	366.7	494.6	90	349.9	501.1	120	351.4	499.9

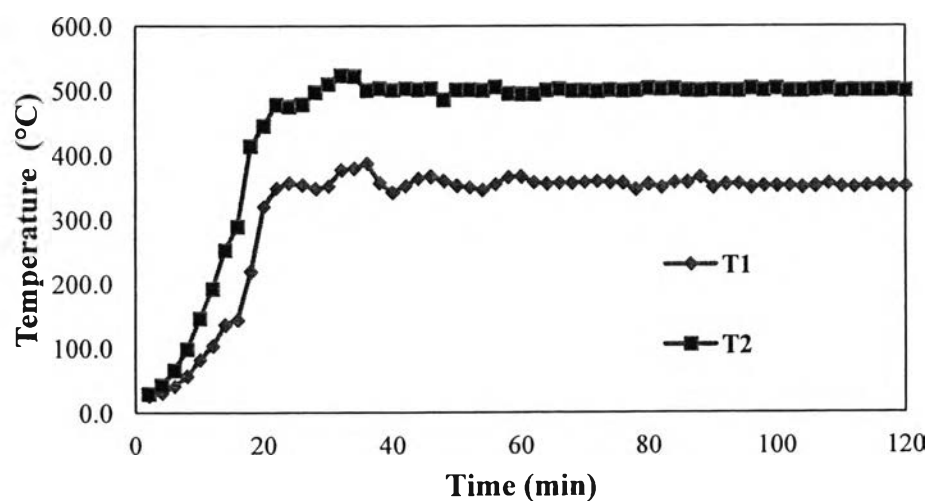
**Figure A14** Temperature profiles of HBETA/SAPO-34.

Table A15 Pyrolysis conditions: 5 %Co/(HBETA+SAPO-34)Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.0	32.9	32	392.0	498.7	62	366.0	499.6	92	353.3	499.5
4	31.0	45.9	34	371.2	495.7	64	364.0	500.5	94	353.2	499.2
6	40.5	65.6	36	341.0	503.1	66	360.7	498.8	96	350.1	501.2
8	58.9	99.2	38	330.5	505.7	68	357.8	500.8	98	356.5	499.6
10	83.3	140.0	40	341.7	496.3	70	350.7	499.9	100	351.3	498.7
12	121.4	199.0	42	359.3	493.6	72	348.6	499.0	102	356.4	498.5
14	153.4	247.3	44	368.3	500.0	74	345.1	501.4	104	357.0	498.8
16	182.1	328.7	46	363.2	495.4	76	343.7	507.5	106	356.2	499.9
18	213.7	354.7	48	350.0	497.7	78	343.1	509.5	108	350.0	501.6
20	273.4	431.8	50	345.8	499.4	80	346.7	500.4	110	351.2	499.9
22	336.7	458.1	52	337.0	502.7	82	347.9	499.3	112	353.4	502.1
24	313.0	470.1	54	364.2	502.0	84	350.0	501.0	114	352.2	499.0
26	362.7	456.0	56	370.0	501.1	86	351.1	499.8	116	356.8	500.7
28	383.7	523.4	58	360.0	499.8	88	351.1	500.2	118	354.2	501.4
30	390.1	521.0	60	368.8	500.1	90	353.0	499.3	120	352.1	500.4

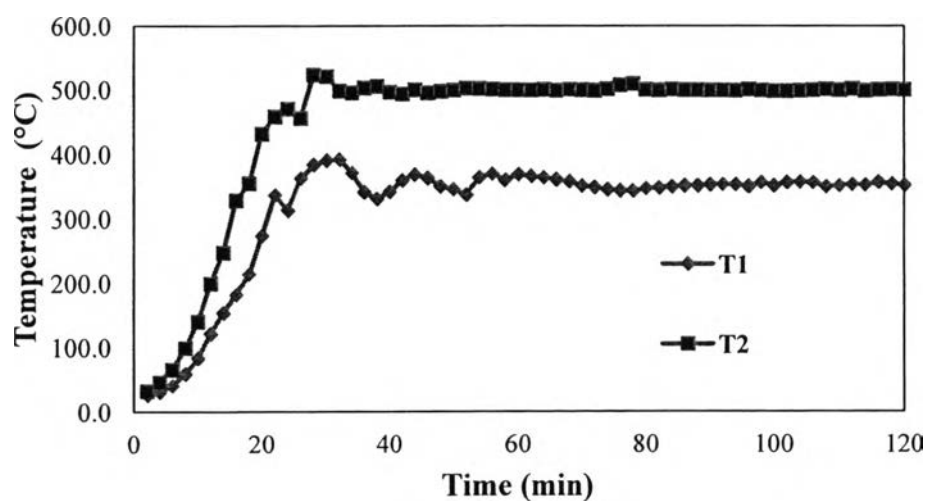
**Figure A15** Temperature profiles of 5 %Co/(HBETA+SAPO-34).

Table A16 Pyrolysis conditions: HZSM-5/SAPO-34Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	25.6	26.0	32	356.7	535.7	62	355.1	500.7	92	344.2	492.2
4	31.9	39.6	34	378.5	523.0	64	352.1	511.3	94	348.7	496.8
6	42.7	60.4	36	380.9	495.0	66	369.0	521.5	96	350.0	500.3
8	62.1	96.2	38	393.1	479.8	68	350.5	522.3	98	350.4	500.4
10	84.7	134.6	40	377.3	465.7	70	367.3	520.1	100	350.1	500.1
12	110.9	178.0	42	345.7	456.7	72	375.1	521.5	102	347.5	500.1
14	143.0	227.5	44	342.3	445.2	74	376.1	519.4	104	349.8	499.7
16	179.6	282.4	46	356.7	457.3	76	364.3	509.1	106	352.3	489.9
18	211.1	340.5	48	375.3	442.1	78	364.1	502.5	108	352.1	499.8
20	250.5	372.3	50	356.7	453.1	80	350.9	501.1	110	352.1	499.9
22	318.7	439.4	52	345.3	456.2	82	357.3	499.8	112	344.7	501.2
24	308.7	492.1	54	353.4	466.8	84	363.2	489.4	114	345.9	502.1
26	341.1	452.3	56	363.0	470.0	86	357.3	476.9	116	351.2	500.0
28	344.2	468.7	58	355.7	499.7	88	344.7	476.0	118	348.9	501.3
30	349.5	473.8	60	350.1	500.0	90	338.9	490.5	120	349.1	500.7

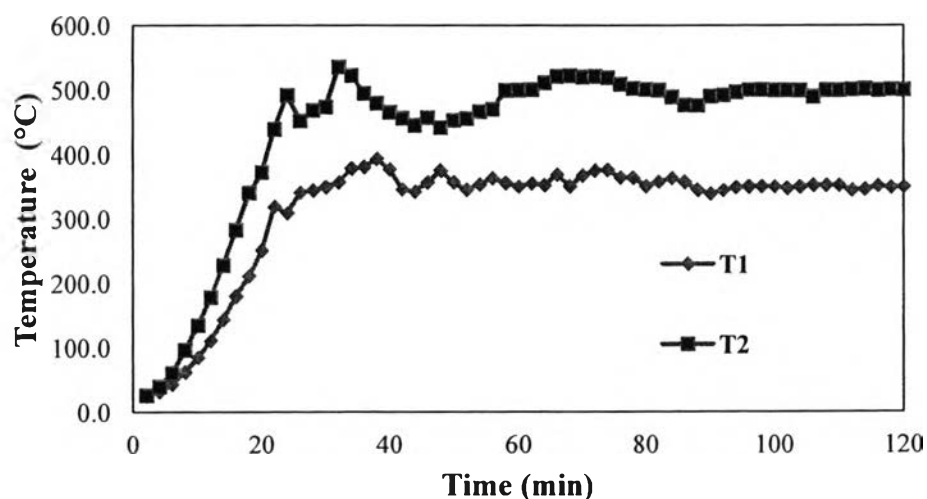
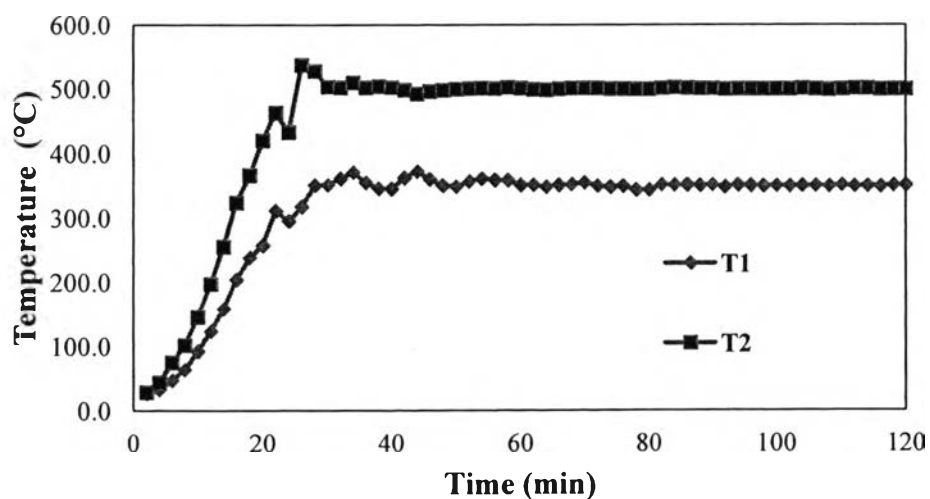
**Figure A16** Temperature profiles of HZSM-5/SAPO-34.

Table A17 Pyrolysis conditions: 5 %Co/(HZSM-5+SAPO-34)Tire = 30 g, N₂ flow = 30 ml/min

Pyrolysis Temperature (T2) = 500 °C

Catalytic Temperature (T1) = 350 °C

Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2	Time (min)	T1	T2
2	26.7	28.5	32	361.2	502.1	62	351.1	499.1	92	348.1	499.5
4	32.2	43.8	34	371.2	509.5	64	348.5	498.7	94	351.2	500.1
6	47.1	75.0	36	355.4	502	66	351.2	499.9	96	350.5	499.8
8	63.4	102.1	38	345.7	504.3	68	352.3	501.1	98	349.6	500.2
10	92.4	146.1	40	345.5	502.3	70	355.1	500.9	100	350.3	500.1
12	123.7	197.0	42	362.2	498.3	72	349.8	501.1	102	349.9	500.2
14	158.6	255.4	44	372.3	492.4	74	348.5	499.9	104	350.3	501.1
16	204.1	323.8	46	360.3	496.1	76	349.8	500.1	106	350.2	499.8
18	238.5	366.5	48	350.5	498	78	343.7	499.4	108	349.8	498.8
20	257.5	420.3	50	348.7	499.7	80	343.5	499.5	110	351.1	499.9
22	311.2	463.2	52	356.9	500.4	82	351.7	501.3	112	349.6	501
24	295.2	433.1	54	361.1	501	84	351.2	502.3	114	350	501.1
26	317.7	537.3	56	359.1	500.4	86	351.5	501.4	116	349.5	499.7
28	351.1	527.7	58	358.7	502.3	88	350.4	500.5	118	351	500
30	351.5	503.3	60	351.2	500.9	90	351.5	500.8	120	351.2	499.8

**Figure A17** Temperature profiles of 5 %Co/(HZSM-5+SAPO-34).

Appendix B Yields of Pyrolysis Products

Table B1 Yield of products obtained from from pyrolysis with 5 %Co/SAPO-34

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
SAPO-34	22.1	34.6	43.5
5 %Co/SAPO-34	24.2	34.1	41.9

Table B2 Yield of products obtained from from pyrolysis with 5 %Co/HY

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HY	22.4	34.1	43.5
5 %Co/HY	21.6	36.3	42.2

Table B3 Yield of products obtained from from pyrolysis with 5 %Co/HBETA

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HBETA	17.9	40.1	42.4
5 %Co/HBETA	22.4	37.3	41.4

Table B4 Yield of products obtained from from pyrolysis with 5 %Co/HMOR

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HMOR	18.7	37.4	43.8
5 %Co/HMOR	20.5	35.1	45.5

Table B5 Yield of products obtained from from pyrolysis with 5 %Co/HZSM-5

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HZSM-5	23.3	33.2	43.9
5 %Co/HZSM-5	23.8	32.7	44.1

Table B6 Yield of products obtained from from pyrolysis with 5 %Co/(HY+SAPO-34)

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HY/SAPO-34	16.9	38.2	45.1
5 %Co/(HY+SAPO-34)	18.2	38.9	42.9

Table B7 Yield of products obtained from from pyrolysis with 5 %Co/(HMOR+SAPO-34)

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HMOR/SAPO-34	17.6	39.6	43.4
5 %Co/(HMOR+SAPO-34)	14.5	42.5	41.9

Table B8 Yield of products obtained from from pyrolysis with 5 %Co/(HBETA+SAPO-34)

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HBETA/SAPO-34	14.3	43.9	42.1
5 %Co/(HETA+SAPO-34)	19.8	37.5	43.1

Table B9 Yield of products obtained from from pyrolysis with 5 %Co/
(HZSM-5+SAPO-34)

Sample	Yield (%)		
	Gas	Liquid	Solid
Non-Catalyst	17.0	40.0	43.7
HZSM-5/SAPO-34	16.6	40.6	44.7
5 %Co/(HZSM-5+SAPO-34)	16.7	40.0	43.8

Appendix C Gas Yield (%)

Table C1 Yield of gas composition obtained from pyrolysis with 5 %Co/SAPO-34

Sample Component	Non-Catalyst	SAPO-34	5 %Co/SAPO-34
Methane	3.479	5.125	4.912
Ethylene	1.820	1.782	2.111
Ethane	2.987	4.370	4.504
Propylene	1.900	2.216	2.603
Propane	1.490	2.454	2.573
C4	3.012	4.434	5.163
C5	2.034	1.573	1.982
C6	0.237	0.473	0.421
C7	0.007	0.012	0.014
C8	0.000	0.089	0.001
Total	17.0	22.5	24.3

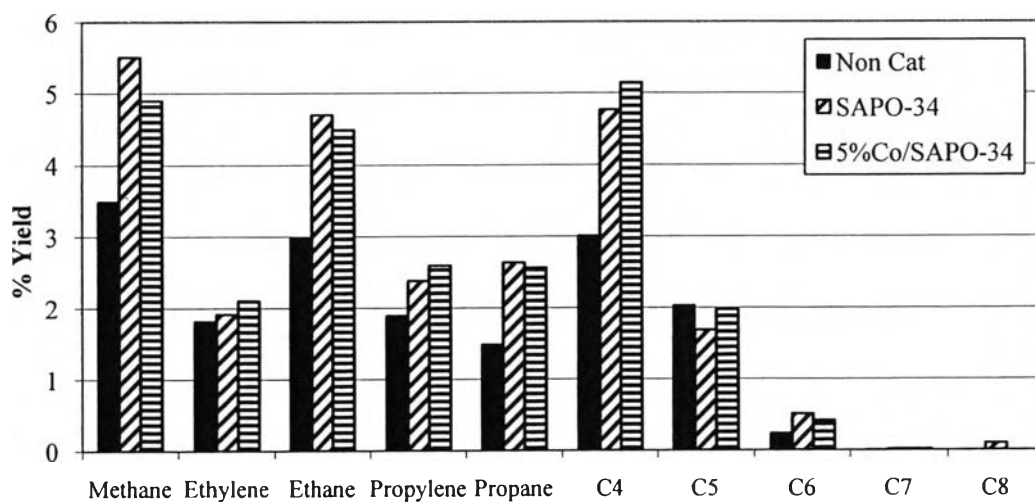


Figure C1 Gas yields obtained from pyrolysis with 5 %Co/SAPO-34 catalyst.

Table C2 Yield of gas composition obtained from pyrolysis with 5 %Co/HY

Sample Component	Non-Catalyst	HY	5 %Co/HY
Methane	3.479	4.192	5.156
Ethylene	1.820	2.011	2.119
Ethane	2.987	3.805	4.642
Propylene	1.900	2.807	2.724
Propane	1.490	2.277	2.636
C4	3.012	4.966	5.065
C5	2.034	2.058	2.460
C6	0.237	0.239	0.792
C7	0.007	0.016	0.067
C8	0.000	0.002	0.001
Total	17.0	22.4	25.7

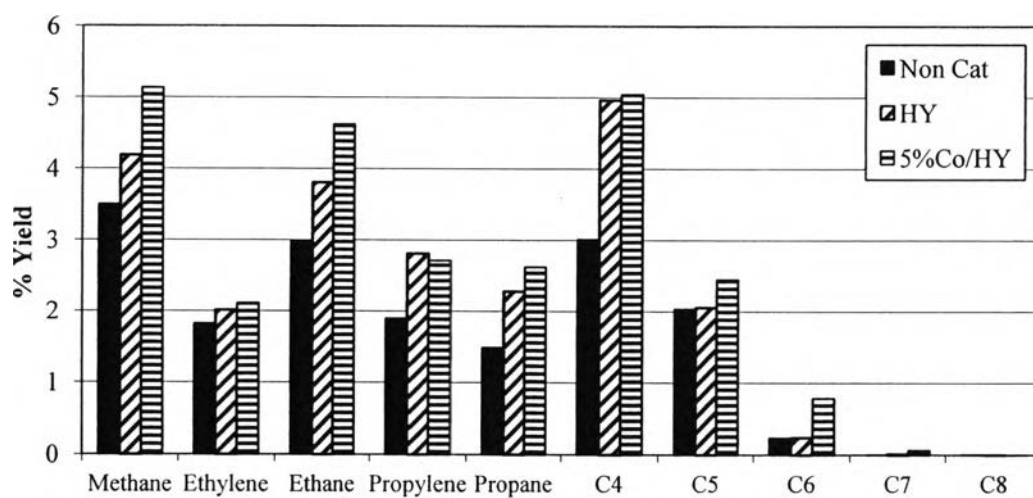
**Figure C2** Gas yields obtained from pyrolysis with 5 %Co/HY catalyst.

Table C3 Yield of gas composition obtained from pyrolysis with 5 %Co/HMOR

Sample Component	Non-Catalyst	HMOR	5 %Co/HMOR
Methane	3.479	4.109	4.597
Ethylene	1.820	1.198	1.220
Ethane	2.987	3.592	4.143
Propylene	1.900	1.183	0.984
Propane	1.490	3.504	3.399
C4	3.012	3.605	4.094
C5	2.034	1.266	1.587
C6	0.237	0.275	0.460
C7	0.007	0.033	0.015
C8	0.000	0.000	0.002
Total	17.0	18.8	20.5

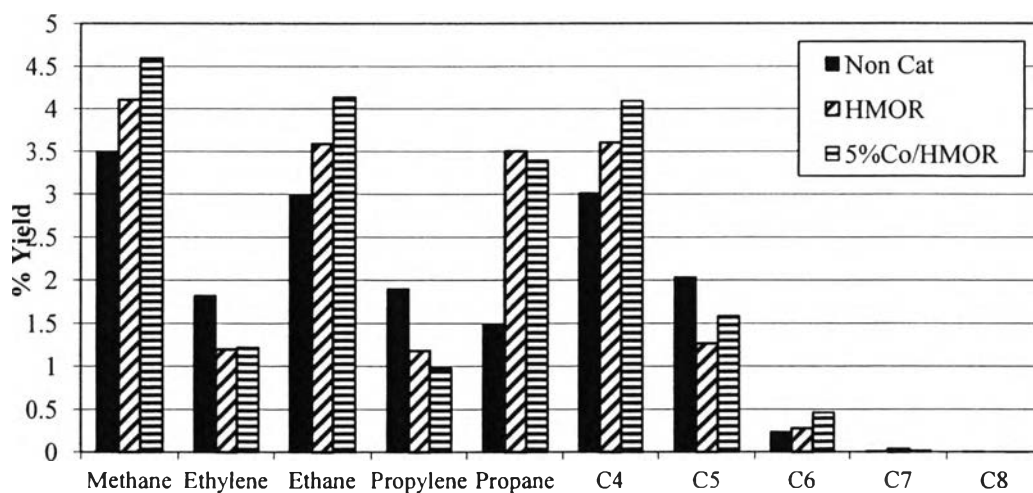
**Figure C3** Gas yields obtained from pyrolysis with 5 %Co/HMOR catalyst.

Table C4 Yield of gas composition obtained from pyrolysis with 5 %Co/HBETA

Sample Component	Non-Catalyst	HBETA	5 %Co/HBETA
Methane	3.479	2.911	2.911
Ethylene	1.820	1.260	1.331
Ethane	2.987	2.539	2.770
Propylene	1.900	0.931	1.527
Propane	1.490	2.718	2.151
C4	3.012	5.061	5.556
C5	2.034	1.962	2.828
C6	0.237	0.504	1.401
C7	0.007	0.031	0.715
C8	0.000	0.000	0.127
Total	17.0	18.0	21.3

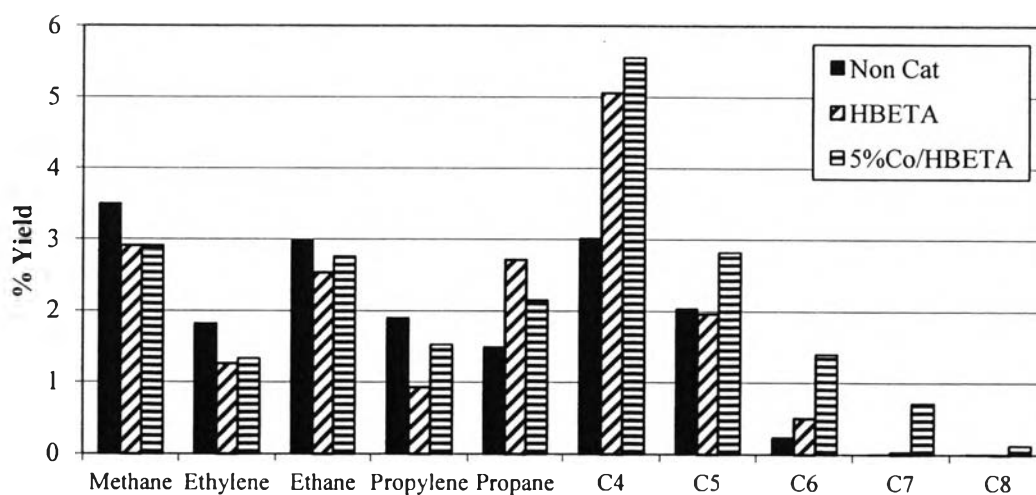
**Figure C4** Gas yields obtained from pyrolysis with 5 %Co/HBETA catalyst.

Table C5 Yield of gas composition obtained from pyrolysis with 5 %Co/HZSM-5

Sample Component	Non-Catalyst	HZSM-5	5 %Co/HZSM-5
Methane	3.479	3.758	4.520
Ethylene	1.820	1.276	1.782
Ethane	2.987	4.036	4.106
Propylene	1.900	1.414	0.925
Propane	1.490	4.278	4.925
C4	3.012	4.903	4.938
C5	2.034	1.879	1.804
C6	0.237	1.588	0.648
C7	0.007	0.134	0.106
C8	0.000	0.001	0.005
Total	17.0	23.3	23.8

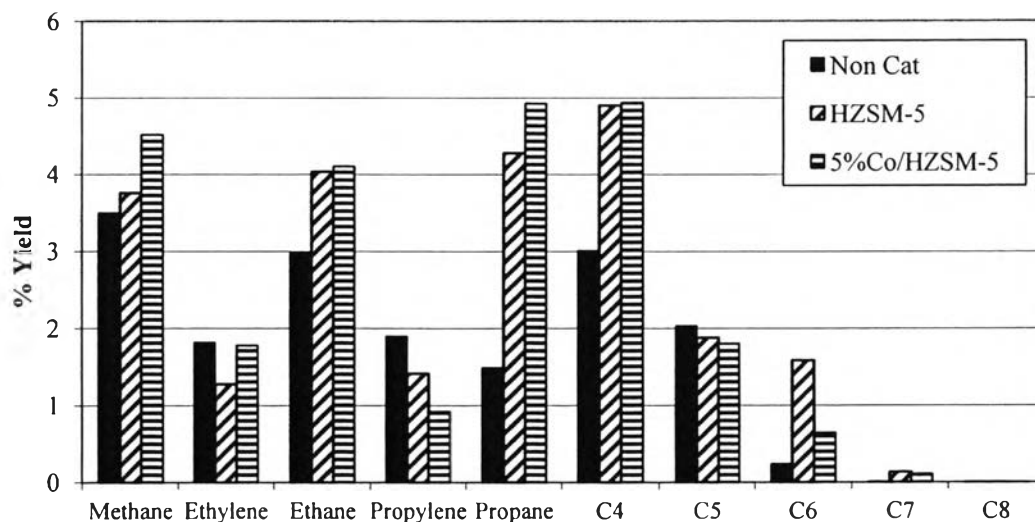
**Figure C5** Gas yields obtained from pyrolysis with 5 %Co/HZSM-5 catalyst.

Table C6 Yield of gas composition obtained from pyrolysis with 5 %Co/(HY+SAPO-34)

Sample Component	Non-Catalyst	HY/SAPO-34	5 %Co/(HY+SAPO-34)
Methane	3.479	2.911	2.932
Ethylene	1.820	1.724	1.911
Ethane	2.987	4.162	4.235
Propylene	1.900	1.622	2.000
Propane	1.490	2.303	2.287
C4	3.012	3.222	3.504
C5	2.034	0.941	1.365
C6	0.237	0.000	0.000
C7	0.007	0.000	0.000
C8	0.000	0.000	0.000
Total	17.0	16.9	18.2

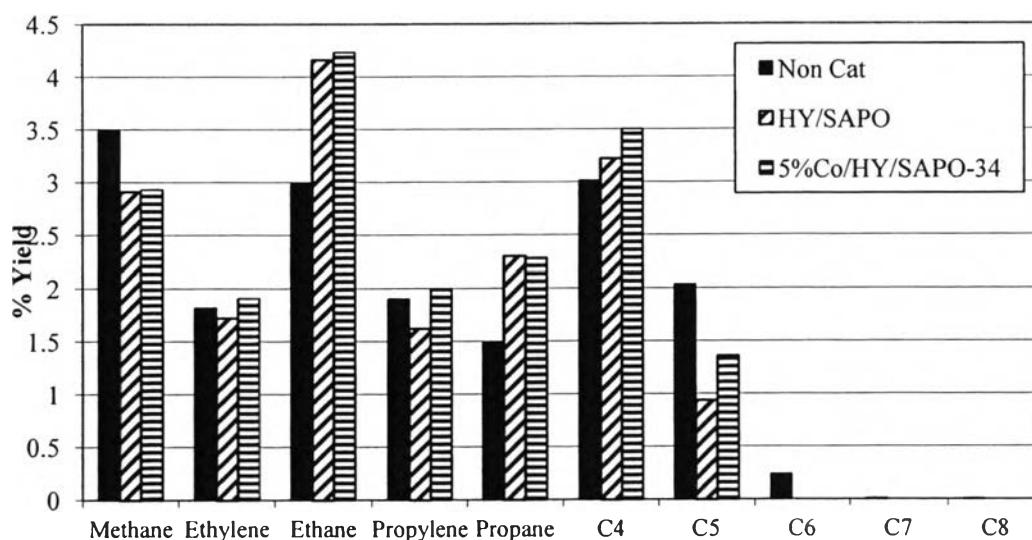


Figure C6 Gas yields obtained from pyrolysis with 5 %Co/(HY+SAPO-34) catalyst.

Table C7 Yield of gas composition obtained from pyrolysis with 5 %Co/(HMOR+SAPO-34)

Sample Component	Non-Catalyst	HMOR/SAPO-34	5 %Co/HMOR/SAPO-34
Methane	3.479	2.538	8.207
Ethylene	1.820	1.782	0.805
Ethane	2.987	3.940	1.781
Propylene	1.900	1.481	0.815
Propane	1.490	2.850	0.972
C4	3.012	3.511	1.550
C5	2.034	1.470	0.408
C6	0.237	0.000	0.000
C7	0.007	0.000	0.000
C8	0.000	0.000	0.000
Total	17.0	17.6	14.5

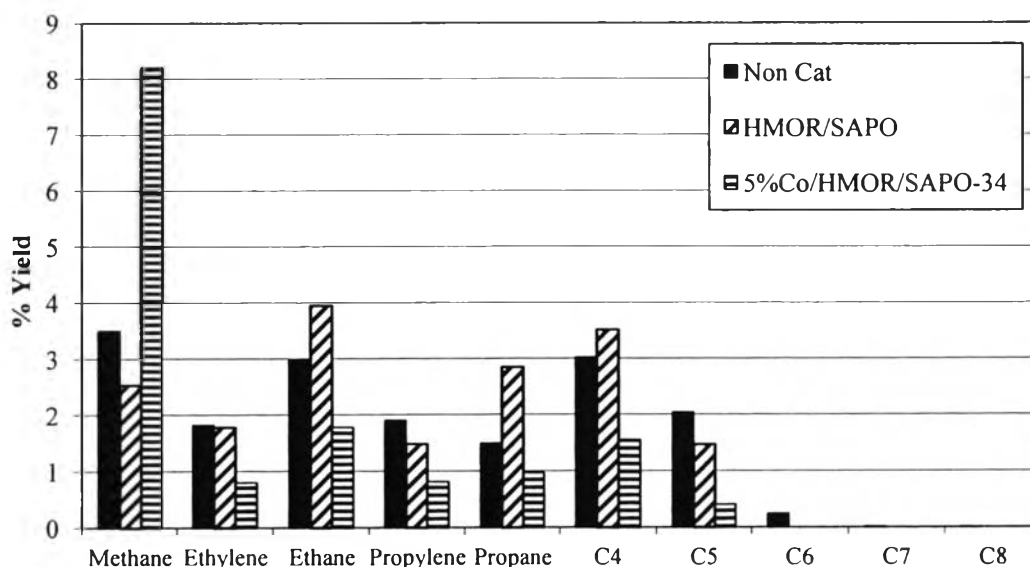


Figure C7 Gas yields obtained from pyrolysis with 5 %Co/HMOR/SAPO-34 catalyst.

Table C8 Yield of gas composition obtained from pyrolysis with 5 %Co/(HBETA+SAPO-34)

Sample Component	Non-Catalyst	HBETA/SAPO-34	5 %Co/(HBETA+SAPO-34)
Methane	3.479	1.82	2.817
Ethylene	1.820	1.166	2.194
Ethane	2.987	2.640	4.031
Propylene	1.900	1.667	2.388
Propane	1.490	1.772	2.075
C4	3.012	3.958	4.645
C5	2.034	1.298	1.651
C6	0.237	0.000	0.000
C7	0.007	0.000	0.000
C8	0.000	0.000	0.000
Total	17.0	14.3	19.8

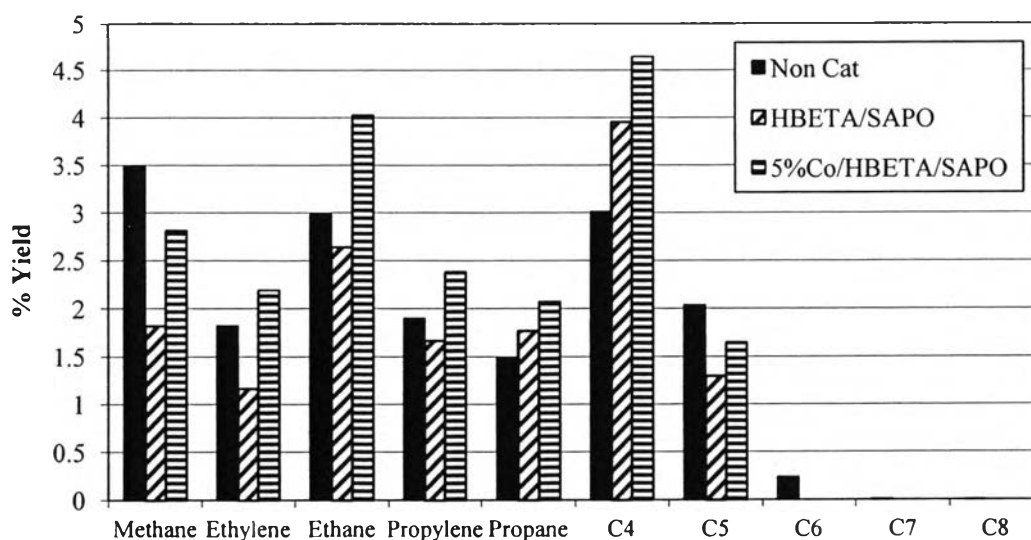


Figure C8 Gas yields obtained from pyrolysis with 5 %Co/(HBETA+SAPO-34) catalyst.

Table C9 Yield of gas composition obtained from pyrolysis with 5 %Co/(HZSM-5+SAPO-34)

Sample Component	Non-Catalyst	HZSM-5/SAPO-34	5 %Co/(HZSM-5+SAPO-34)
Methane	3.479	4.284	3.443
Ethylene	1.820	1.748	0.946
Ethane	2.987	3.876	3.794
Propylene	1.900	0.293	1.405
Propane	1.490	0.450	2.395
C4	3.012	4.710	3.520
C5	2.034	1.135	1.207
C6	0.237	0.000	0.000
C7	0.007	0.000	0.000
C8	0.000	0.000	0.000
Total	17.0	16.6	16.7

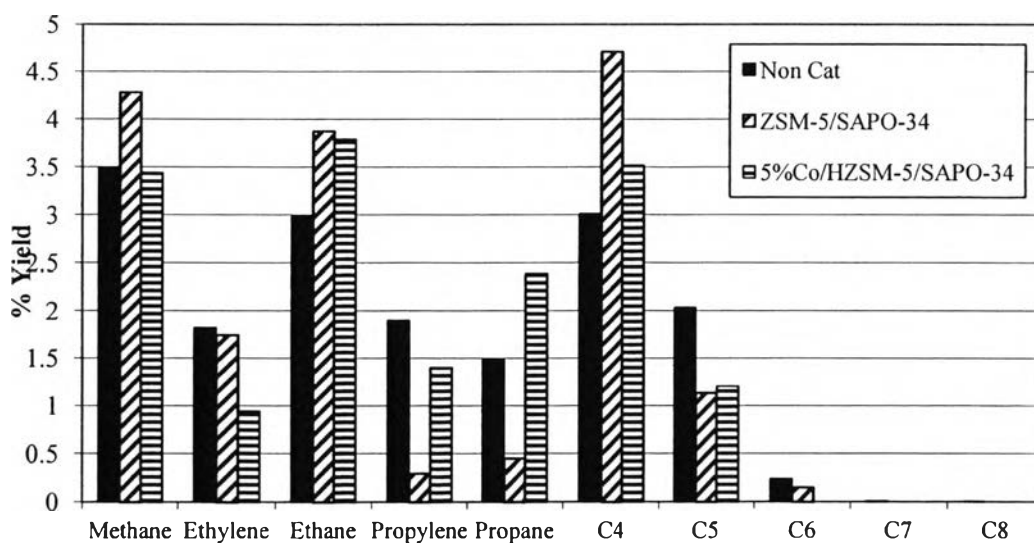


Figure C9 Gas yields obtained from pyrolysis with 5 %Co/(HZSM-5+SAPO-34) catalyst.

Appendix D Chemical Compositions of Maltenes

Table D1 Effect of 5 %Co/SAPO-34

Chemicals	Non-catalyst	SAPO-34	5%Co/SAPO-34
Saturated HCs	55.8	34.4	39.8
Mono-aromatics	7.1	20.6	24.3
Di-aromatics	10.7	11.3	4.7
Poly-aromatics	10.0	23.1	19.9
Polar-aromatics	16.5	10.5	11.3

Table D2 Effect of 5 %Co/HY

Chemicals	Non-catalyst	HY	5%Co/HY
Saturated HCs	55.8	63.1	28.1
Mono-aromatics	7.1	15.8	22.8
Di-aromatics	10.7	7.8	10.3
Poly-aromatics	10.0	10.2	16.7
Polar-aromatics	16.5	3.2	22.2

Table D3 Effect of 5 %Co/HBETA

Chemicals	Non-catalyst	HBETA	5%Co/HBETA
Saturated HCs	58.1	52.7	45.7
Mono-aromatics	12.9	17.3	18.0
Di-aromatics	9.0	10.2	15.1
Poly-aromatics	9.7	14.5	12.0
Polar-aromatics	9.1	5.3	9.1

Table D4 Effect of 5 %Co/HMOR

Chemicals	Non-catalyst	HMOR	5%Co/HMOR
Saturated HCs	55.8	59.1	50.2
Mono-aromatics	7.1	16.0	18.7
Di-aromatics	10.7	4.6	12.5
Poly-aromatics	10.0	11.1	9.2
Polar-aromatics	16.5	7.1	9.4

Table D5 Effect of 5 %Co/HZSM-5

Chemicals	Non-catalyst	HZSM-5	5 %Co/HZSM-5
Saturated HCs	55.8	49.6	37.0
Mono-aromatics	7.1	20.9	25.7
Di-aromatics	10.7	11.4	11.7
Poly-aromatics	10.0	10.0	10.5
Polar-aromatics	16.5	8.1	15.2

Table D7 Effect of 5 %Co/(HY+SAPO-34)

Chemicals	Non-catalyst	HY/ SAPO-34	5 %Co/(HY+ SAPO-34)
Saturated HCs	55.8	40.5	26.5
Mono-aromatics	7.1	27.1	27.0
Di-aromatics	10.7	12.6	7.0
Poly-aromatics	10.0	12.6	13.5
Polar-aromatics	16.5	7.2	26.1

Table D8 Effect of 5 %Co/(HBETA+SAPO-34)

Chemicals	Non-catalyst	HBETA/ SAPO-34	5 %Co/(HBETA+ SAPO-34)
Saturated HCs	55.8	32.4	27.2
Mono-aromatics	7.1	29.1	24.0
Di-aromatics	10.7	8.1	6.5
Poly-aromatics	10.0	13.0	19.4
Polar-aromatics	16.5	17.3	22.9

Table D9 Effect of 5 %Co/(HZSM-5+SAPO-34)

Chemicals	Non-catalyst	HZSM-5/ SAPO-34	5 %Co/(HZSM-5+ SAPO-34)
Saturated HCs	55.8	35.3	36.3
Mono-aromatics	7.1	23.4	20.2
Di-aromatics	10.7	28.2	5.7
Poly-aromatics	10.0	1.5	7.3
Polar-aromatics	16.5	11.6	30.6

Appendix E True Boiling Point Curve of Chemical Compositions in Pyrolytic Oils

Table E1 True boiling point curves: - non catalyst

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	59.1	67.9	65.2	63.7	61.6	34.1
5	123.8	170.8	179.6	80.7	87.0	87.2
10	154.7	205.8	228.5	99.8	98.3	209.0
15	179.0	223.8	251.8	253.8	99.8	235.6
20	199.7	238.4	262.7	324.9	101.1	252.8
25	221.7	249.9	274.3	356.0	102.8	276.1
30	236.3	257.4	288.2	369.1	106.3	292.2
35	251.1	265.1	298.6	382.9	110.6	313.2
40	260.4	274.0	310.5	390.6	111.4	338.3
45	271.6	282.8	320.4	400.2	143.3	355.7
50	283.5	293.3	332.1	409.5	344.5	375.4
55	295.1	303.9	343.6	419.2	396.4	390.5
60	309.0	313.4	356.8	426.1	419.2	409.3
65	320.9	325.5	367.3	434.1	434.2	426.4
70	334.6	337.0	379.2	442.5	446.1	442.0
75	351.4	354.3	389.5	450.4	457.9	457.8
80	368.8	375.2	402.0	460.7	468.0	470.2
85	387.2	397.6	419.8	470.4	476.5	481.5
90	413.7	429.2	440.5	481.3	487.2	495.7
95	463.1	467.0	470.0	499.3	508.2	526.8
100	544.7	520.8	522.2	542.2	547.1	570.6

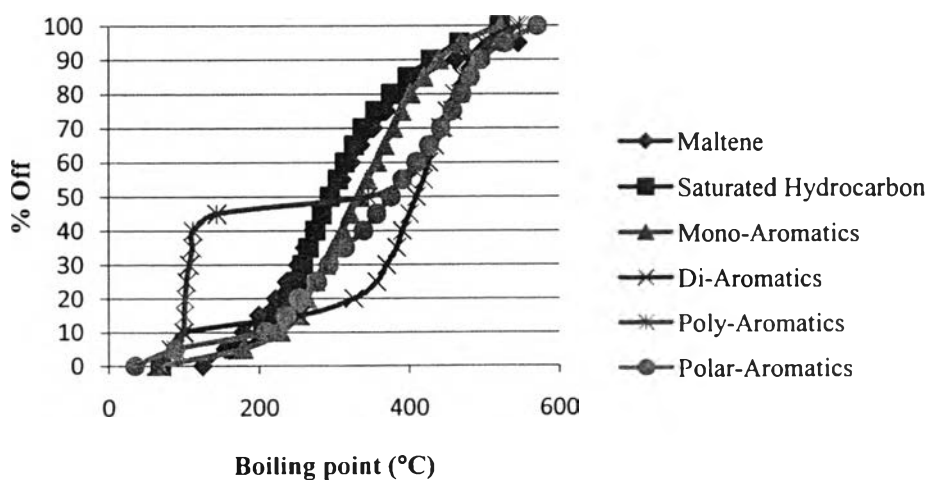


Table E2 True boiling point curves: - SAPO-34

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	71.4	67.3	67.1	67	61.4	54.2
5	112.1	72.5	72.4	71.9	71.9	71.8
10	113.1	73.3	77.7	72.8	83.1	185.1
15	142.9	78.4	86.0	77.8	83.5	214.7
20	143.4	87.2	163.9	83.6	83.7	218.7
25	148.2	148.7	206.2	84.2	84.0	219.4
30	161.3	174.3	226.9	85.0	84.2	233.4
35	173.0	192.4	238.7	100.1	84.5	251.1
40	191.5	207.5	254.7	192.9	84.8	261.5
45	208.9	217.7	270.0	278.5	175.3	276.4
50	223.2	228.8	286.3	334.3	234.7	293.6
55	235.7	236.6	297.2	360.8	262.5	307.8
60	250.4	245.4	311.2	386.5	300.9	326.1
65	266.9	256.8	325.9	411.8	332.5	345.0
70	288.1	271.0	342.2	435.0	371.0	379.1
75	307.8	287.7	368.5	445.8	411.7	411.6
80	338.0	305.3	397.4	457.8	443.0	437.6
85	385.8	333.4	434.0	471.9	464.3	458.9
90	441.3	398.0	455.8	486.6	485.1	483.2
95	478.4	462.3	486.4	505.4	508.6	510.1
100	528.8	525.0	531.1	540.6	544.5	547.1

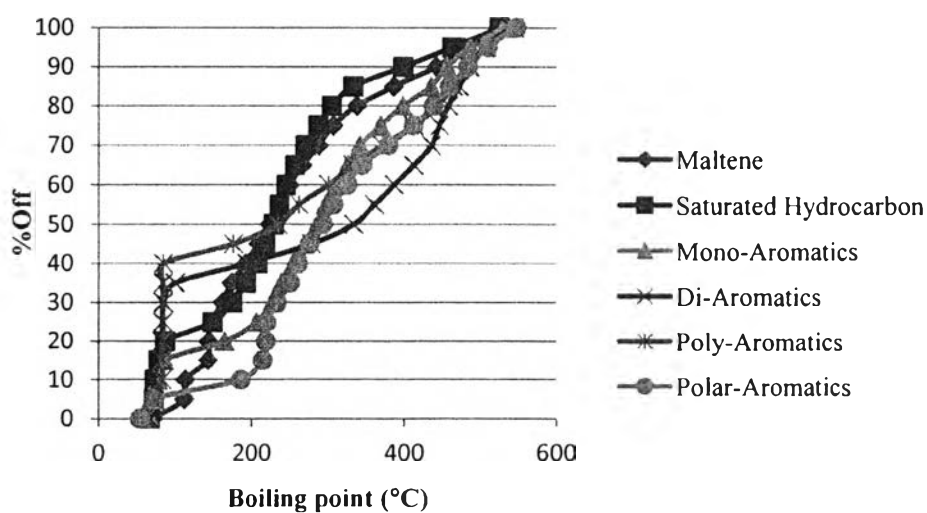


Table E3 True boiling point curves: - 5 %Co/SAPO-34

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	52.7	66.7	65.2	58.6	62.9	60.8
5	133.2	174.7	154.4	86.5	99.5	102.8
10	153.7	210.6	198.4	121.0	101.4	218.9
15	173.1	226.5	221.9	205.5	103.6	249.1
20	192.6	239.1	238.8	234.1	106.3	277.6
25	217.5	249.5	251.3	254.8	106.7	294.3
30	231.3	256.3	258.1	269.7	110.2	320.2
35	246.8	262.3	269.3	289.3	110.7	342.9
40	255.5	270.2	277.6	315.9	110.9	356.1
45	264.5	277.3	289.5	338.1	111.1	373.4
50	274.6	287.0	303.0	356.8	111.3	384.3
55	286.4	294.7	314.6	368.0	111.6	399.3
60	298.0	306.7	325.9	380.1	112.2	415.4
65	312.3	317.1	339.7	388.1	117.2	430.6
70	325.8	328.4	356.7	397.5	127.3	443.8
75	344.0	345.7	371.7	408.1	128.8	458.0
80	365.9	368.2	387.2	422.1	136.3	469.7
85	387.7	391.0	405.2	436.4	281.5	481.2
90	415.8	424.6	430.7	458.3	396.4	495.8
95	460.3	464.6	464.4	489.6	445.2	527.3
100	546.6	517.4	515.6	565.3	509.7	569.2

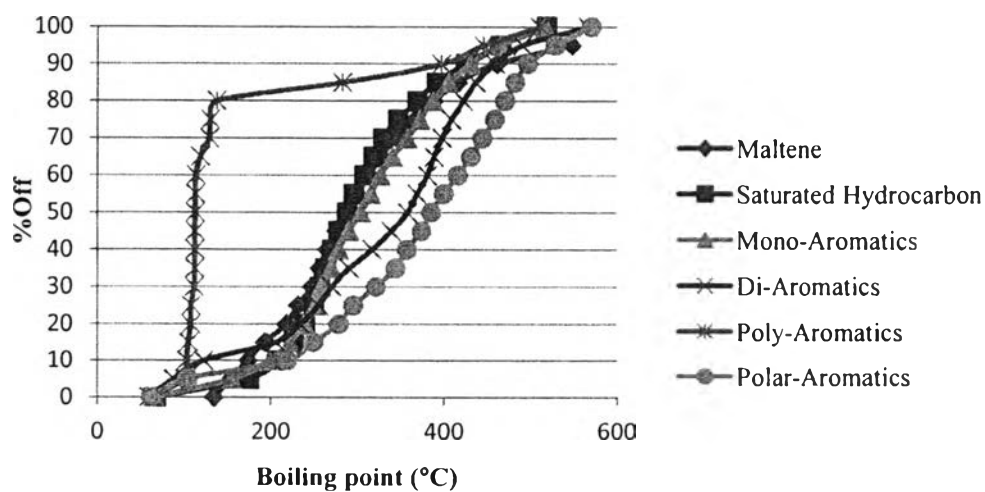


Table E4 True boiling point curves: - 5 %Co/HY

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	53.8	56.9	57.7	53.6	53.3	57.2
5	54.8	79.6	96.2	74.5	78.4	208.1
10	59.1	139.9	148.3	100.6	87.9	258.4
15	104.0	157.7	164.4	183.5	91.4	282.0
20	125.0	173.2	178.1	215.0	95.5	300.6
25	134.0	187.8	194.4	235.2	99.9	314.2
30	141.7	199.7	201.3	243.2	103.5	325.4
35	152.4	211.1	211.1	245.9	241.5	337.1
40	168.5	222.1	219.3	261.7	259.5	389.9
45	187.9	232.8	225.7	266.1	268.4	390.3
50	204.7	243.4	232.5	274.4	281.6	390.9
55	220.5	254.1	242.8	283.0	294.7	408.7
60	231.5	266.6	255.5	294.9	304.2	428.7
65	247.7	282.0	269.3	304.4	312.2	438.5
70	265.2	296.1	283.9	315.6	322.6	448.6
75	283.3	314.1	298.2	329.2	334.9	459.1
80	299.9	335.7	320.5	347.2	349.8	470.3
85	320.9	372.5	389.9	369.5	368.5	482.1
90	389.7	414.6	417.5	395.6	389.1	496.3
95	399.5	454.6	460.5	438.7	427.4	512.9
100	460.2	500.8	520.4	494.3	491.3	551.6

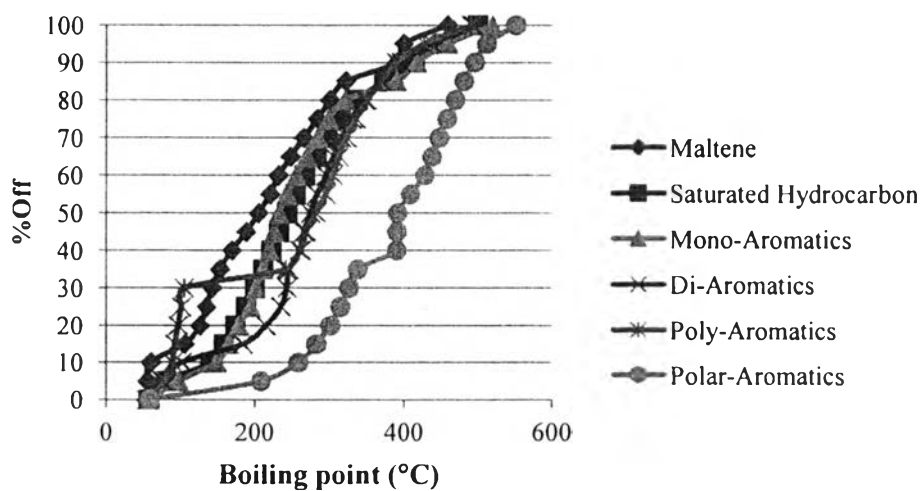


Table E5 True boiling point curves: - 5 %Co/HMOR

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	54.4	69.2	67.5	59.5	59.9	34.7
5	126.3	78.4	79.2	73.8	65.4	69.3
10	148.3	79.9	86.1	78.2	70.0	177.6
15	155.3	86.6	100.8	78.9	79.4	215.7
20	174.8	149.4	205.8	79.4	86.7	234.5
25	195.3	207.1	245.3	84.9	96.9	235.1
30	219.5	231.1	265.3	86.4	98.1	249.7
35	234.9	248.8	287.5	96.3	98.7	264.7
40	249.9	259.4	307.8	99.1	99.7	279.5
45	260.2	271.3	325.2	103.8	100.5	296.0
50	272.6	284.8	343.9	155.0	101.4	317.9
55	285.6	295.7	362.1	212.7	102.7	340.6
60	297.6	310.6	377.4	245.7	104.0	360.8
65	312.0	324.7	389.3	272.2	106.4	383.7
70	325.8	340.0	404.0	319.2	110.2	414.1
75	341.1	361.3	421.3	367.8	110.8	449.1
80	362.3	383.0	436.9	395.0	111.2	472.5
85	382.9	409.3	454.6	420.8	116.9	489.2
90	408.0	440.6	472.3	444.2	470.2	514.3
95	445.0	473.6	490.0	475.3	527.3	535.6
100	503.5	524.4	530.6	559.7	575.9	577.3

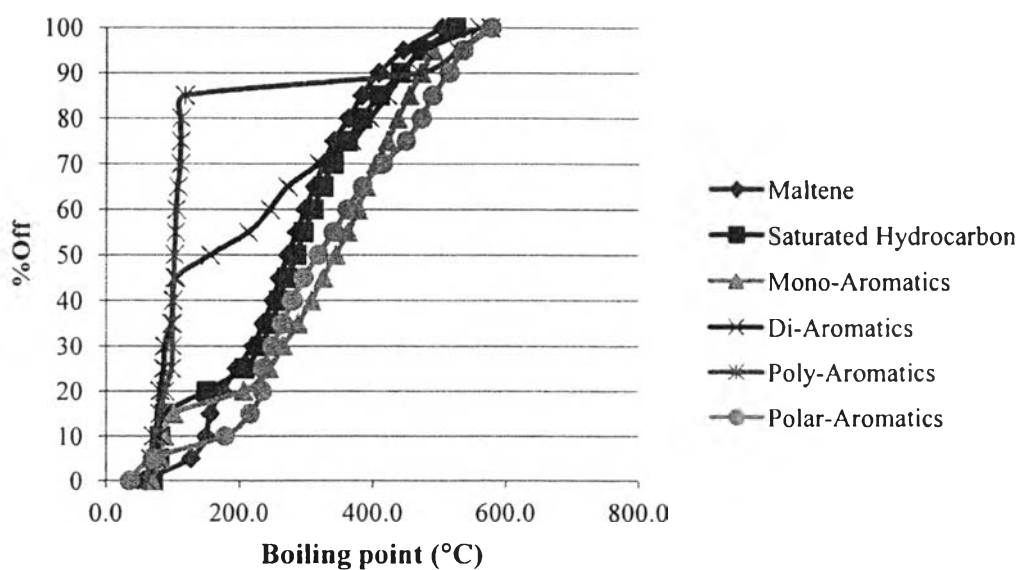


Table E6 True boiling point curves: - HBETA

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	51.0	71.4	65.0	59.3	89.5	52.5
5	120.7	78.7	79.2	74.7	101.5	65.0
10	147.1	81.2	86.4	78.4	105.8	77.5
15	147.8	89.8	99.3	79.0	106.3	110.7
20	159.5	178.2	110.4	85.1	106.6	197.2
25	174.8	208.6	144.7	87.0	110.0	234.2
30	193.4	226.9	171.3	99.3	110.5	235.2
35	214.0	243.1	193.4	109.5	110.8	258.5
40	228.1	254.5	218.0	118.0	111.0	281.6
45	245.6	264.2	236.3	163.9	111.1	311.5
50	256.4	275.9	255.2	204.0	111.4	341.9
55	269.6	290.0	276.1	227.0	111.9	362.4
60	285.5	306.0	307.1	248.9	115.2	383.7
65	302.8	320.7	337.3	266.4	119.7	413.6
70	320.2	338.1	368.2	297.2	127.0	454.4
75	342.1	359.9	390.9	348.5	127.8	475.5
80	367.6	381.8	413.9	386.7	131.6	490.1
85	391.9	406.4	433.6	416.7	135.7	508.3
90	425.2	438.9	454.6	440.8	135.7	527.5
95	473.9	473.9	476.5	464.4	177.9	544.3
100	513.9	524.6	521.9	487.4	462.2	582.6

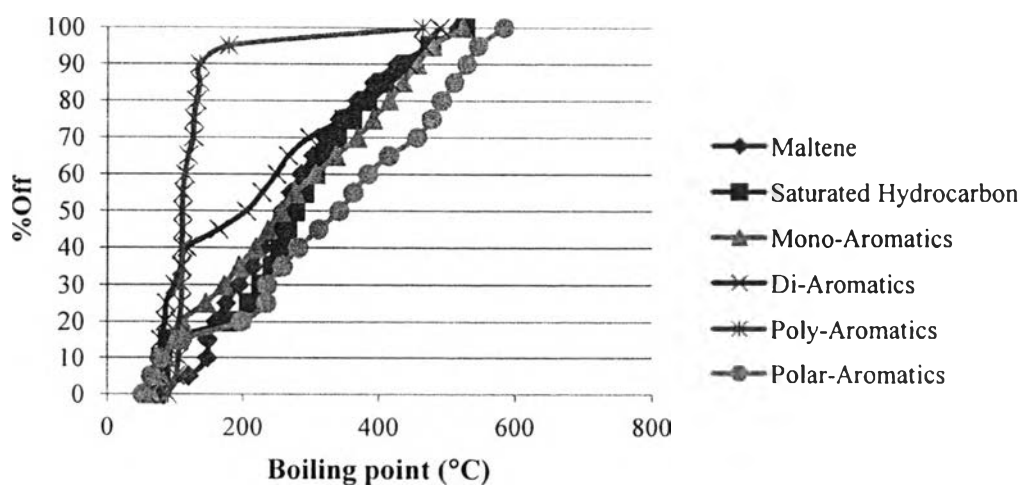


Table E7 True boiling point curves: - 5 %Co/HBETA

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	61.0	67.5	65.8	61.2	63.3	37.3
5	148.0	180.7	207.4	72.7	80.0	67.9
10	155.3	217.4	248.4	75.4	97.5	177.1
15	179.1	231.1	263.0	78.4	99.2	234.2
20	199.5	246.9	277.7	78.9	100.0	235.2
25	220.7	254.8	293.8	79.3	101.2	254.4
30	234.4	262.1	309.1	80.6	102.6	284.6
35	249.6	272.3	323.4	85.9	104.0	317.8
40	258.1	280.2	335.6	87.0	106.3	349.7
45	270.7	291.2	348.6	97.8	106.7	371.8
50	283.1	302.1	360.1	102.2	110.2	390.3
55	297.2	312.5	371.7	110.5	110.6	415.5
60	313.8	324.9	381.6	289.4	110.8	434.9
65	330.5	337.1	389.8	355.5	111.1	450.5
70	351.8	354.0	401.2	375.3	111.4	464.8
75	373.2	372.8	414.8	389.1	112.6	476.2
80	393.0	392.4	429.7	404.6	127.0	487.7
85	419.7	419.7	445.7	423.6	311.3	502.7
90	447.7	449.4	465.6	447.1	419.5	525.1
95	476.1	478.9	483.7	479.4	455.0	541.0
100	523.3	526.0	526.7	547.5	510.0	580.0

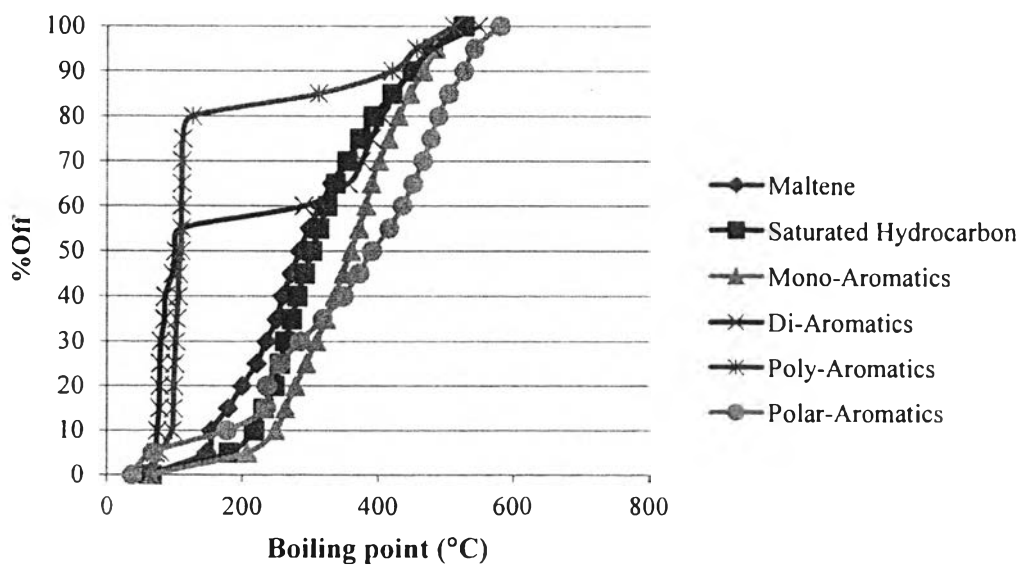


Table E8 True boiling point curves: - HZSM-5

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	52.9	70.1	66.3	62.2	59.1	38.5
5	121.8	99.3	79.7	76.6	99.9	96.4
10	148.3	172.0	81.0	88.8	140.9	120.2
15	155.6	192.9	88.5	191.5	190.0	129.7
20	179.3	214.1	172.5	246.6	237.0	168.7
25	202.3	228.0	246.2	265.0	265.7	208.1
30	223.5	242.0	261.2	290.4	292.8	234.0
35	240.0	253.9	278.1	322.7	311.8	235.7
40	254.5	260.4	296.4	357.4	328.5	245.0
45	263.1	271.4	315.4	385.7	343.7	259.2
50	275.5	282.1	334.4	410.4	344.4	277.3
55	290.3	295.5	355.0	427.6	358.4	288.1
60	306.7	311.4	372.3	440.9	372.7	310.9
65	323.0	327.3	389.4	451.7	373.3	336.1
70	342.9	346.3	406.8	462.5	373.8	360.5
75	367.2	368.2	425.5	470.8	387.6	387.1
80	391.3	389.4	441.8	477.8	405.6	420.0
85	421.3	415.9	458.6	486.3	423.6	458.2
90	453.0	444.8	473.6	497.1	443.2	483.7
95	484.4	475.4	490.0	523.8	464.2	524.3
100	554.6	525.0	529.6	556.1	487.1	572.4

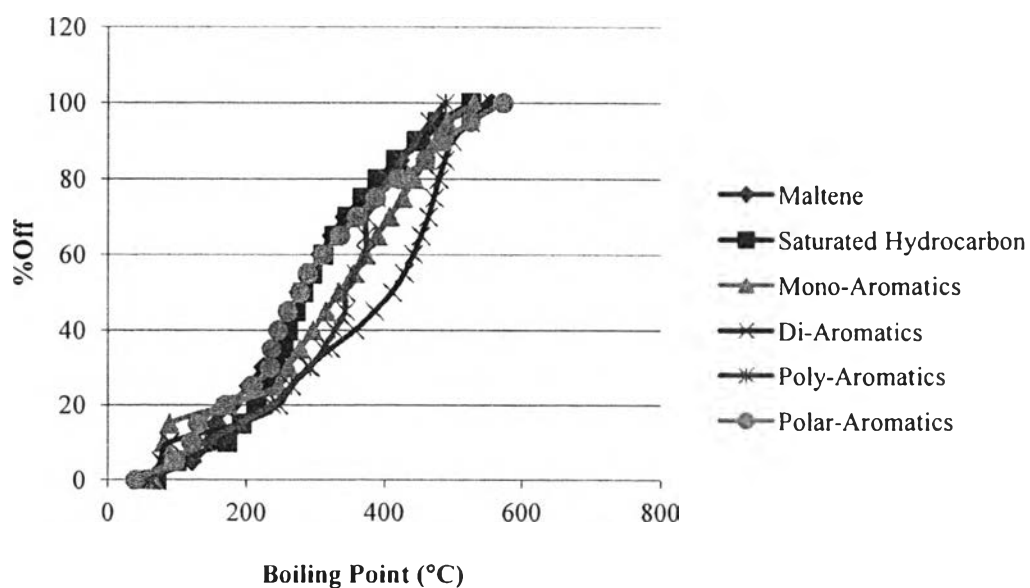


Table E9 True boiling point curves: - 5 %Co/HZSM-5

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	56.3	73.5	73.7	67.3	68.8	67.3
5	124.4	80.0	80.4	79.2	87.1	218.0
10	148.8	81.7	82.6	80.4	98.4	257.4
15	154.7	88.5	91.9	87.3	99.3	305.6
20	166.2	148.5	172.9	98.6	100.6	337.5
25	180.8	189.2	221.3	152.3	102.3	356.8
30	200.4	213.5	243.7	269.1	104.3	368.2
35	222.3	228.9	255.5	290.4	110.8	380.2
40	238.1	243.9	266.1	309.6	112.2	388.0
45	254.0	254.9	275.5	320.0	222.9	397.9
50	265.7	263.3	288.7	334.6	309.2	406.7
55	280.3	275.2	300.7	347.4	334.3	417.4
60	298.5	290.6	313.5	360.0	348.9	426.2
65	318.1	306.1	326.0	371.4	362.8	435.5
70	338.9	322.9	340.9	383.1	372.4	445.0
75	363.3	341.1	359.1	395.0	385.0	454.8
80	385.2	367.9	377.9	410.7	394.8	465.0
85	409.8	393.8	397.4	428.4	406.9	473.7
90	438.5	428.1	425.3	446.7	424.4	483.3
95	469.9	465.6	458.1	470.6	447.8	499.0
100	520.6	517.0	507.9	511.4	482.3	537.4

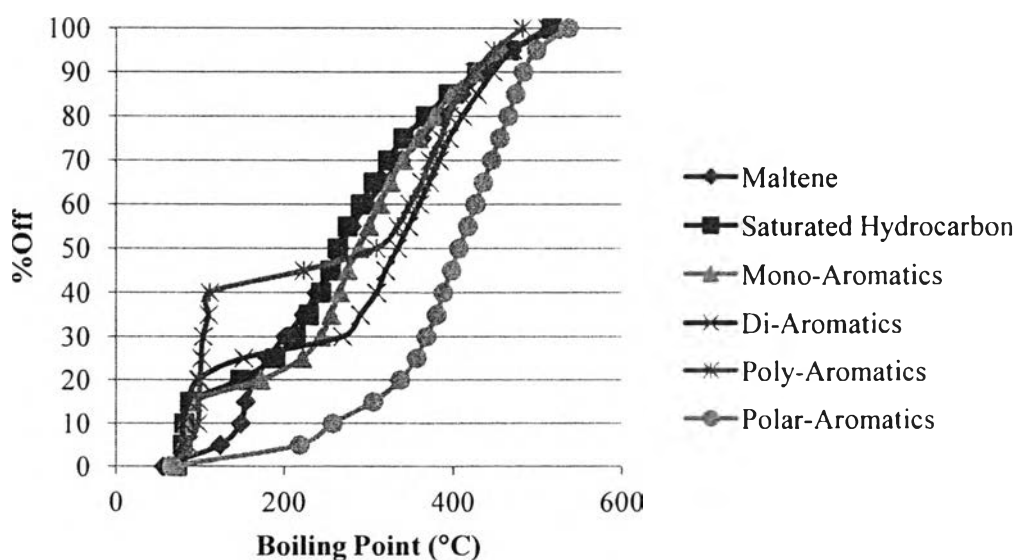


Table E10 True boiling point curves: - HY/SAPO-34

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	54.2	57.9	60.9	56.5	56.1	51.7
5	58.5	66.9	65.0	60.9	64.5	57.8
10	135.8	162.4	65.9	62.5	69.8	78.6
15	139.0	198.2	70.3	63.9	76.0	183.7
20	154.2	210.4	79.5	65.3	76.7	209.5
25	171.3	221.6	192.9	65.6	77.3	209.8
30	190.2	228.9	223.4	66.0	78.8	223.4
35	204.3	237.5	242.2	66.4	79.4	251.3
40	215.7	247.6	263.6	70.0	80.2	311.4
45	227.0	260.5	282.9	70.5	81.5	332.2
50	238.5	270.7	297.2	72.1	82.5	400.3
55	252.4	282.9	312.9	77.7	84.0	489.9
60	268.7	293.9	328.1	82.4	85.3	501.9
65	286.7	303.7	342.7	499.8	89.8	509.2
70	301.7	317.4	390.3	509.9	95.7	517.4
75	322.6	333.7	394.0	521.5	97.9	524.9
80	389.8	390.1	422.8	528.4	494.2	530.9
85	395.6	397.3	441.4	536.2	514.8	538.1
90	447.8	439.3	458.1	545.6	530.4	547.0
95	501.5	472.8	479.9	558.0	546.8	558.9
100	560.8	531.6	519.2	578.6	575.0	578.8

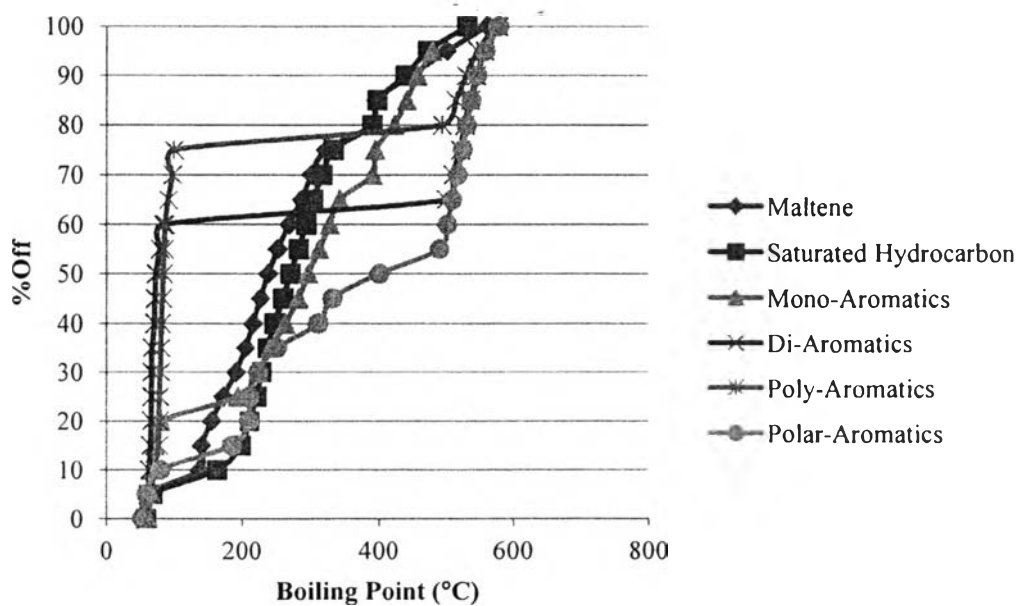


Table E11 True boiling point curves: - 5 %Co/(HY+SAPO-34)

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	58.3	59.5	63.2	61.0	68.8	162.6
5	132.8	175.8	181.0	188.2	87.4	248.9
10	155.0	206.0	204.9	217.5	237.3	280.5
15	176.4	218.6	218.2	224.9	246.8	300.7
20	197.2	229.1	226.9	234.1	261.3	316.3
25	210.3	241.2	234.8	241.8	275.4	328.5
30	222.8	252.6	245.0	250.6	283.7	342.4
35	233.8	263.2	256.6	261.1	292.9	390.1
40	247.0	270.6	267.8	270.5	303.7	390.8
45	263.2	279.9	278.3	278.7	314.9	407.7
50	278.3	290.4	288.1	287.2	331.3	429.3
55	292.9	295.6	296.3	295.8	389.7	438.3
60	308.3	309.0	308.8	305.5	390.5	448.3
65	327.2	325.4	324.2	317.0	402.4	458.1
70	389.9	389.7	340.2	331.7	427.6	468.0
75	390.8	390.8	390.4	389.8	441.3	477.6
80	423.2	422.6	409.4	390.7	453.2	488.3
85	445.9	443.9	439.3	420.6	465.6	498.8
90	466.2	461.7	460.2	446.8	480.5	509.9
95	489.6	484.6	484.8	473.4	500.1	526.1
100	533.5	530.4	532.4	523.6	539.9	560.8

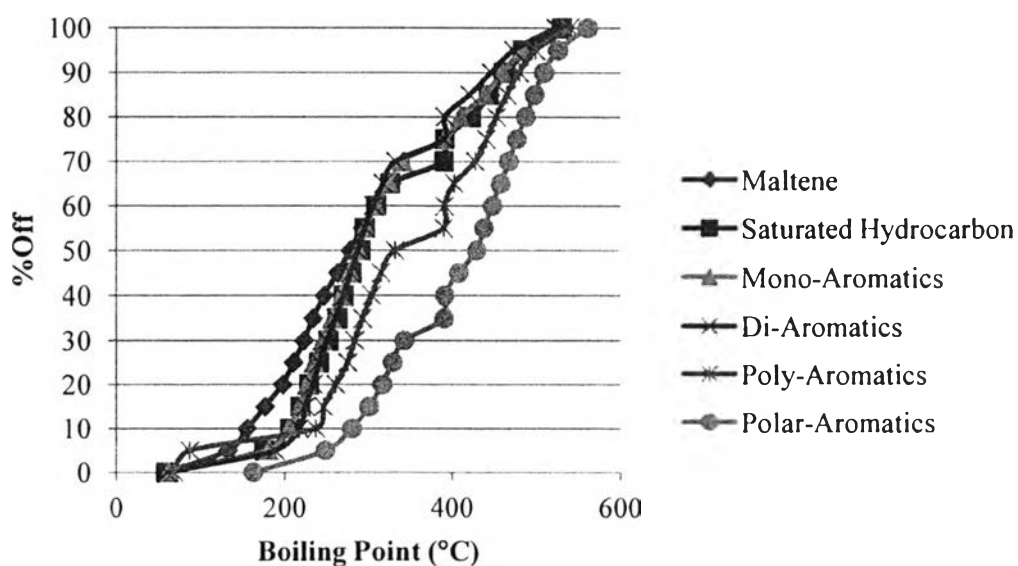


Table E12 True boiling point curves: - HMOR/SAPO-34

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	53.6	60.5	57.8	55.5	55.4	52.3
5	54.6	72.8	72.2	63.4	64.9	169.9
10	104.2	73.8	73.5	64.3	75.2	207.8
15	133.4	78.3	77.0	67.9	77.7	222.0
20	141.3	86.4	79.6	69.4	79.9	257.2
25	151.7	142.5	91.1	75.9	83.0	289.3
30	169.0	169.9	146.1	81.5	89.1	313.9
35	189.5	193.9	179.2	97.0	141.7	331.4
40	205.6	211.9	209.8	150.5	264.9	389.9
45	221.5	227.3	235.1	181.6	306.3	390.7
50	233.6	241.3	249.5	216.3	326.8	404.4
55	251.2	251.8	267.2	256.8	341.9	423.5
60	273.2	264.9	288.0	296.2	390.4	435.6
65	292.1	280.8	305.9	318.5	391.0	439.9
70	311.7	297.3	325.0	329.5	412.3	448.3
75	334.5	314.5	346.1	341.9	431.1	456.9
80	390.3	336.3	365.6	390.1	441.2	466.6
85	416.6	366.6	385.9	390.9	451.9	477.6
90	449.3	403.0	414.9	420.4	465.2	492.4
95	480.7	448.4	453.1	449.0	484.0	511.2
100	523.4	505.8	503.1	513.8	533.4	551.5

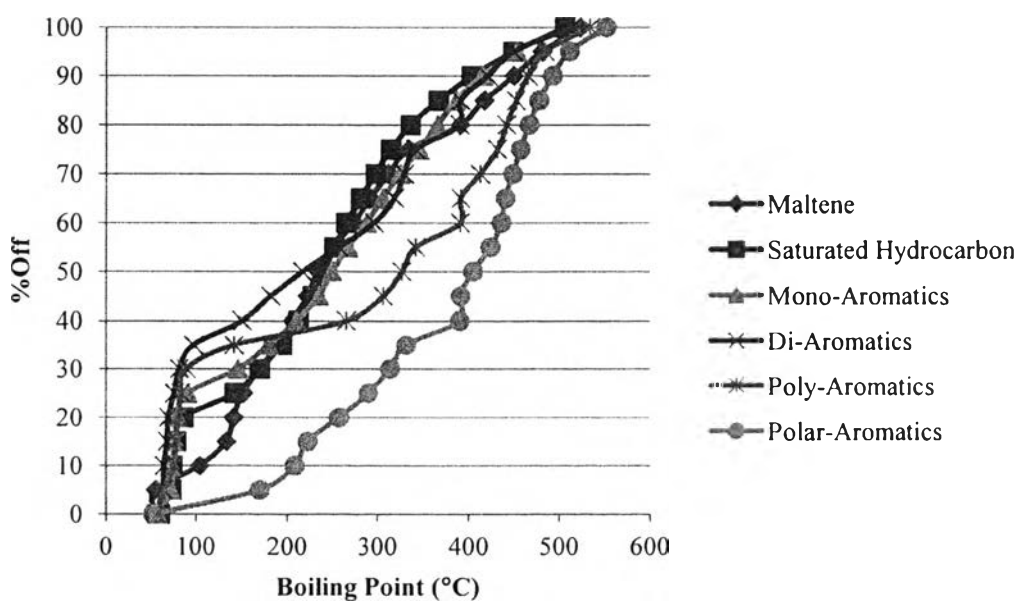


Table E13 True boiling point curves: - 5 %Co/(HMOR+SAPO-34)

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	58.1	58.1	58.5	58.3	58.2	58.3
5	124.8	68.9	75.9	74.1	74.7	191.1
10	139.3	165.6	150.5	187.6	92.4	205.8
15	150.4	188.7	180.4	217.5	261.9	243.1
20	168.8	202.7	197.8	235.9	277.9	275.9
25	192.5	213.7	213.9	254.7	293.1	296.1
30	206.2	222.3	222.0	265.8	304.0	310.0
35	220.1	230.1	229.5	277.6	311.6	319.7
40	232.6	241.3	239.8	282.7	321.1	327.6
45	248.1	253.3	249.1	292.9	330.7	338.0
50	265.6	263.0	260.5	301.9	338.5	389.8
55	282.7	274.5	272.7	310.1	389.8	390.2
60	298.6	284.5	282.8	320.9	390.3	390.7
65	319.8	293.6	293.4	331.9	390.8	402.3
70	341.0	305.8	307.4	342.3	401.4	422.4
75	390.6	322.5	326.9	390.2	421.0	436.0
80	425.4	341.4	389.8	394.1	436.9	447.9
85	450.1	390.9	400.3	425.3	449.7	461.2
90	472.1	439.2	441.9	446.3	466.5	478.9
95	498.4	479.2	474.2	475.7	497.3	504.1
100	544.4	550.3	533.3	546.6	554.0	553.4

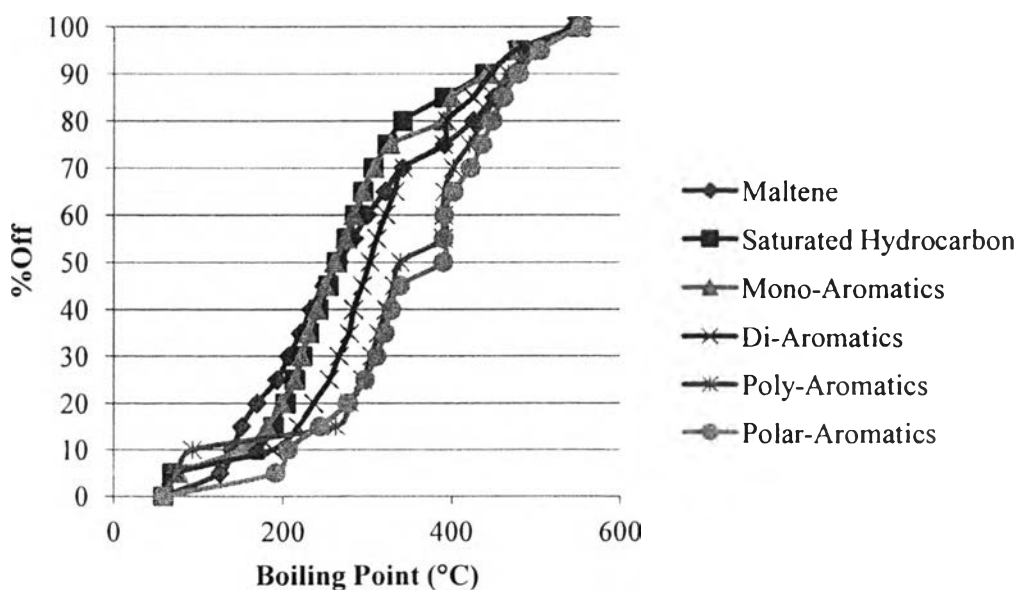


Table E14 True boiling point curves: - HBETA/SAPO-34

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	54.0	57.0	57.6	55.9	53.6	57.1
5	59.9	133.6	83.2	154.3	90.0	238.3
10	111.9	167.9	153.6	201.8	214.9	265.9
15	133.7	183.1	171.3	221.9	242.3	285.3
20	148.6	195.4	190.3	224.2	261.8	300.0
25	169.5	205.5	199.3	226.5	266.6	311.4
30	191.5	213.3	211.1	241.6	276.8	321.7
35	207.3	221.9	220.2	243.8	283.7	331.6
40	222.6	230.3	228.1	250.8	294.3	341.9
45	234.6	239.4	235.3	261.4	300.2	390.1
50	249.5	250.0	246.5	266.7	308.0	390.6
55	265.9	263.0	259.4	277.2	319.2	397.9
60	282.1	272.6	273.1	284.2	331.1	418.5
65	296.5	284.3	285.4	293.2	344.4	434.7
70	313.9	296.1	297.4	303.0	361.8	442.6
75	334.1	312.8	315.6	315.3	380.2	453.4
80	390.2	337.8	338.1	332.7	401.9	464.5
85	410.1	393.4	390.7	390.0	423.3	476.8
90	444.5	441.7	436.7	404.3	445.0	491.9
95	473.2	471.8	470.4	447.8	469.2	509.5
100	541.7	531.6	529.9	524.7	510.6	549.8

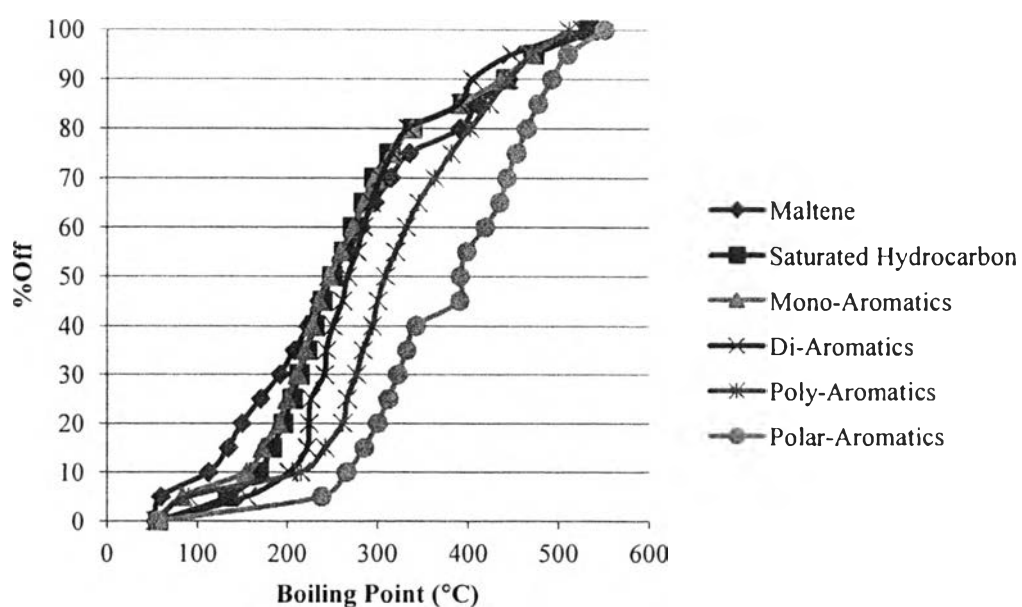


Table E15 True boiling point curves: - 5 %Co/(HBETA+SAPO-34)

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	55.7	56.8	56.0	55.4	55.9	55.4
5	130.9	152.7	159.6	63.6	67.7	161.8
10	140.3	180.6	199.9	208.8	74.1	219.3
15	159.9	195.5	216.6	240.0	75.0	284.0
20	181.4	205.7	223.7	257.1	76.7	311.0
25	198.8	215.4	232.7	272.8	78.3	321.8
30	213.5	223.0	240.6	280.4	79.9	334.0
35	223.7	229.9	248.6	289.5	82.0	343.0
40	236.9	240.5	257.4	297.3	86.9	390.0
45	250.0	252.4	264.9	304.9	97.7	390.5
50	264.8	263.3	274.6	312.9	289.5	393.7
55	279.9	276.4	281.6	322.5	307.2	411.3
60	293.6	288.7	288.9	331.9	326.1	427.9
65	309.5	300.4	297.2	341.4	341.8	434.9
70	327.1	320.0	306.5	390.1	390.4	443.4
75	389.7	341.8	318.6	390.7	396.6	453.0
80	390.6	390.9	333.8	406.6	427.8	463.5
85	419.5	433.6	390.0	432.8	444.0	476.0
90	447.1	457.3	401.8	450.0	460.1	492.7
95	476.8	484.9	499.3	476.3	482.1	512.9
100	540.6	536.4	531.3	541.0	536.1	556.2

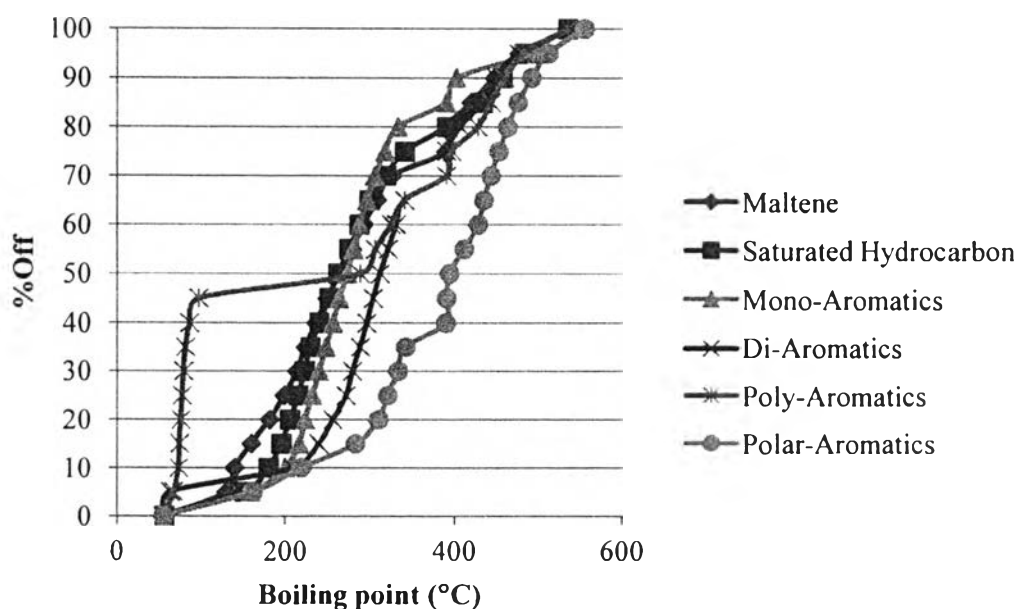


Table E16 True boiling point curves: - HZSM-5/SAPO-34

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	53.8	57.8	57.7	57.5	57.9	56.8
5	103.6	62.6	75.7	64.5	76.5	175.8
10	133.5	64.8	134.4	69.1	79.1	239.4
15	141.5	65.4	154.8	75.6	81.2	269.5
20	154.6	69.2	170.3	78.1	83.4	286.4
25	171.1	70.9	185.8	80.8	88.6	302.6
30	194.9	133.0	198.0	86.4	89.9	314.1
35	208.4	169.7	207.2	95.5	96.4	324.6
40	223.4	191.1	218.6	133.0	99.6	334.3
45	236.2	206.9	225.3	141.2	141.4	389.7
50	251.6	219.0	233.3	154.2	168.2	390.1
55	269.7	230.1	245.2	170.5	202.6	390.6
60	285.3	245.7	261.3	195.9	227.3	396.6
65	298.5	236.6	276.9	208.5	250.9	416.9
70	314.5	279.5	290.7	224.6	274.4	433.4
75	332.2	295.9	305.4	242.2	289.3	442.8
80	390.0	318.4	327.8	262.9	310.1	454.4
85	399.0	389.9	390.0	290.1	337.3	467.1
90	440.6	421.3	417.4	327.0	391.2	482.2
95	474.4	461.4	460.9	415.3	453.8	502.2
100	541.5	526.0	527.3	511.6	524.7	545.8

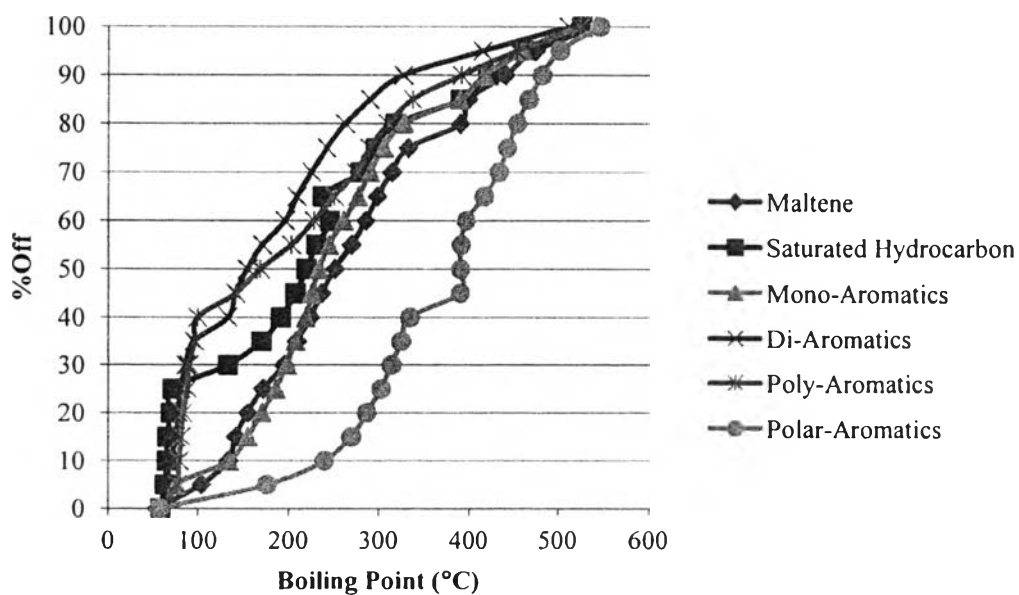
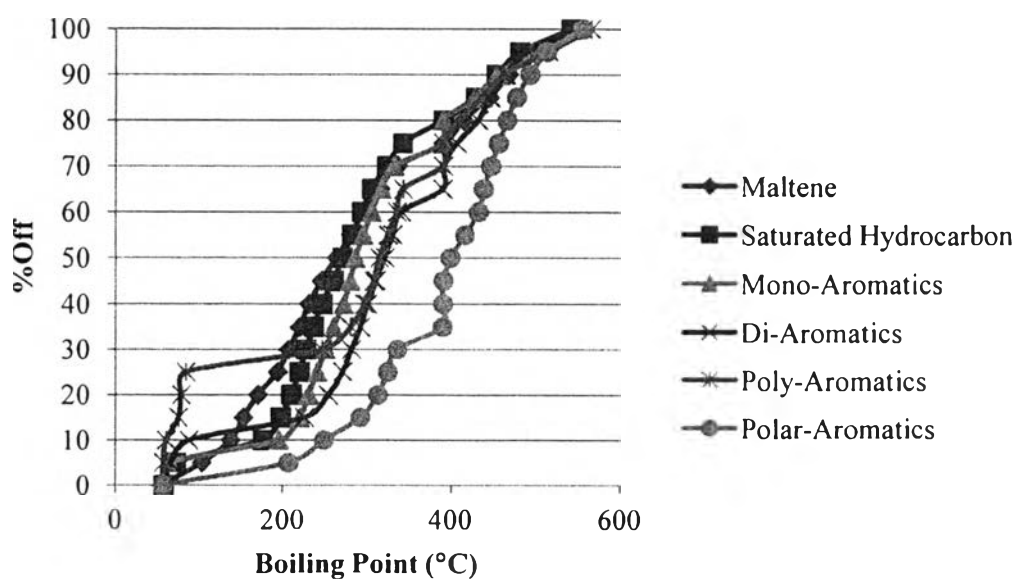


Table E17 True boiling point curves: - 5 %Co/(HZSM-5+SAPO-34)

% OFF	Boiling Point					
	Maltene	Saturated Hydrocarbon	Mono-aromatics	Di-aromatics	Poly-aromatics	Polar-aromatics
0	54.3	57.5	56.5	56.1	55.6	56.3
5	103.6	72.3	64.5	65.4	56.9	206.7
10	138.1	176.9	195.8	88.1	60.1	248.3
15	153.4	197.8	219.9	225.4	75.3	291.6
20	170.6	210.3	230.2	253.4	78.5	312.5
25	194.0	219.7	240.6	270.7	84.3	324.2
30	206.6	226.9	250.4	281.0	246.4	335.6
35	219.9	236.2	259.5	291.7	279.7	389.7
40	230.4	246.5	271.9	300.2	296.4	390.2
45	245.2	259.7	279.8	310.4	307.2	390.7
50	263.0	270.5	285.8	320.8	314.5	398.9
55	280.1	281.6	295.4	330.3	324.5	416.0
60	295.3	293.1	305.2	340.7	335.2	432.2
65	315.1	304.9	317.1	390.0	342.7	438.0
70	336.1	322.9	332.2	390.7	390.2	446.5
75	390.3	342.2	389.8	406.4	390.7	455.4
80	414.2	390.8	390.8	431.8	408.7	465.4
85	444.6	428.7	427.5	445.5	436.6	476.8
90	467.7	452.8	453.9	463.7	461.7	492.5
95	496.6	480.4	495.2	489.6	515.0	512.3
100	548.1	541.3	557.8	545.2	565.0	555.6



Appendix F Coke Formation

Table F1 Coke formation – 5 %Co/SAPO-34

Catalysts	Coke (g)	Coke (g/g cat.)	Coke (%)
SAPO-34	2.024	0.114	11.362
5 %Co/SAPO-34	2.261	0.138	13.786

Table F2 Coke formation – 5 %Co supported on acid zeolites (HY, HMOR, HBETA, and HZSM-5)

Catalysts	Coke (g)	Coke (g/g cat.)	Coke (%)
HY	3.066	0.171	17.093
5 %Co/HY	1.995	0.217	21.720
HMOR	3.355	0.148	14.751
5 %Co/HMOR	1.643	0.112	11.234
HBETA	2.330	0.210	21.034
5 %Co/HBETA	3.047	0.222	22.214
HZSM-5	2.502	0.198	19.780
5 %Co/HZSM-5	1.562	0.082	8.218

Table F2 Coke formation – 5 %Co supported on binary-supports (HY/SAPO-34, HMOR/SAPO-34, HBETA/SAPO-34, and HZSM-5/SAPO-34)

Catalysts	Coke (g)	Coke (g/g cat.)	Coke (%)
HY/SAPO-34	2.397	0.149	14.933
5 %Co/HY/SAPO-34	1.792	0.130	12.986
HMOR/SAPO-34	0.909	0.089	8.949
5 %Co/HMOR/SAPO-34	0.945	0.073	7.344
HBETA/SAPO-34	1.339	0.109	10.873
5 %Co/HBETA/SAPO-34	1.723	0.123	12.258
HZSM-5/SAPO-34	1.310	0.090	8.967
5 %Co/HZSM-5/SAPO-34	0.835	0.056	5.594

Appendix I Pore Volume, Average Pore Size and Surface Area

Table I1 Pore Volume, Pore Size and Surface Area - 5 %Co/SAPO-34

Catalysts	Pore structure	Average Pore size (Å)	Specific surface area (m ² /g)	Total pore volume (cm ³ /g)
SAPO-34	3D	9.4	662.5973	0.4494
5%Co/SAPO-34	3D	8.0	220.663	0.0877

Table I2 Pore Volume, Pore Size and Surface Area - 5 %Co supported on acid zeolites (HY, HMOR, HBETA, and HZSM-5)

Catalysts	Pore structure	Average Pore size (Å)	Specific surface area (m ² /g)	Total pore volume (cm ³ /g)
HY	3D	7.4	590.4	0.6
5%Co/HY	3D	6.8	365.1	0.1
HMOR	1D	7.0	462.5	0.4
5%Co/HMOR	1D	6.3	382.0	0.3
HBETA	3D	7.3	604.3	0.5
5%Co/HBETA	3D	6.7	545.8	1.0
HZSM-5	3D	5.8	373.4	0.2
5%Co/HZSM-5	3D	6.9	251.8	0.2

Table I3 Pore Volume, Pore Size and Surface Area - 5 %Co supported on binary-supports (HY/SAPO-34, HMOR/SAPO-34, HBETA/SAPO-34, and HZSM-5/SAPO-34)

Catalysts	Average Pore structure	Pore size (Å)	Specific surface area (m ² /g)	Total pore volume (cm ³ /g)
HY/SAPO-34	3D	6.8	408.6	0.433
5%Co/HY/SAPO-34	3D	6.7	313.9	0.056
HMOR/SAPO-34	1D/3D	7.1	465.9	0.749
5%Co/HMOR/SAPO-34	1D/3D	7.4	178.9	0.437
HBETA/SAPO-34	3D	7.1	959.5	0.659
5%Co/HBETA/SAPO-34	3D	7.2	264.4	0.532
HZSM-5/SAPO-34	3D	6.0	283.3	0.166
5%Co/HZSM-5/SAPO-34	3D	4.6	157.6	0.159

Appendix J Concentration of Light Mono-aromatics

Table J1 Concentration of light mono-aromatics - 5 %Co/SAPO-34

Carbon number	5 %Co/SAPO-34
C6	0.011
C7	0.077
C8	0.337
BTX	0.425

Table J2 Concentration of light mono-aromatics – 5 %Co supported on acid zeolites (HY, HMOR, HBETA, and HZSM-5)

Carbon number	5 %Co/HY	5 %Co/HMOR	5 %Co/HBETA	5 %Co/HZSM-5
C6	0.013	1.889	0.245	1.098
C7	0.293	2.081	0.388	1.541
C8	1.864	2.268	0.589	2.091
BTX	2.169	6.238	1.222	4.731

Table J3 Concentration of light mono-aromatics – binary-supports (HY/SAPO-34, HMOR/SAPO-34, HBETA/SAPO-34, and HZSM-5/SAPO-34)

Carbon number	HY/ SAPO-34	HMOR/ SAPO-34	HBETA/ SAPO-34	HZSM-5/ SAPO-34
C6	1.249	0.475	0.018	2.274
C7	3.064	0.714	0.292	3.871
C8	5.249	0.990	1.588	5.363
BTX	9.563	2.178	1.897	11.508

Table J4 Concentration of light mono-aromatics - 5 %Co supported on binary-supports (HY/SAPO-34, HMOR/SAPO-34, HBETA/SAPO-34, and HZSM-5/SAPO-34)

Carbon number	5 %Co/HY/SAPO-34	5 %Co/HMOR/SAPO-34	5 %Co/HBETA/SAPO-34	5 %Co/HZSM-5/SAPO-34
C6	1.248	0.009	0.000	0.000
C7	2.431	0.162	0.003	0.002
C8	3.757	1.016	0.045	0.062
BTX	7.437	1.187	0.047	0.062

